



Marble Institute of America
Incorporated

AMERICAN STANDARD SPECIFICATIONS

FOR

THIN EXTERIOR MARBLE VENEER

(2 Inches and Less in Thickness)

AND FOR

THIN EXTERIOR MARBLE
IN CURTAIN OR PANEL WALLS

WITH DETAIL PLATES SHOWING EXAMPLES OF INSTALLATIONS

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**these
american standard specifications,**

are issued by the MARBLE INSTITUTE OF AMERICA as a convenient reference to be used by architects and specification writers when drawing up specifications for Exterior Marble Veneer 2" and less in thickness or Exterior Marble in Curtain or Panel Walls. In this publication the Institute has sought to embody the best practices known to the Marble trade, fair to both purchaser and Marble Contractor. It is understood that only first class workmanship is the standard of the trade and that all material furnished is to be the best obtainable under its respective classification.

The data under "Marble Information and Marble Service" and "Marble Classifications for Soundness" which precedes the specifications and the Detail Plates which follow, are not considered a part of the A.S.A.-approved specifications. This information has been requested by architects and specification writers, so is contained in this publication as a convenience to assist the professional in selecting and detailing Marble for specific installations.

Another publication, entitled "American Standard Specifications for Interior Marble", contains recommended specifications and detail plates for interior Marble installations. Copies may be obtained from any member of the MIA or from the office of the Institute at the address below.

The MARBLE ENGINEERING HANDBOOK, still another publication of the Marble Institute of America, is available to those who are concerned with the physical properties of Marble and the use of Marble as a construction material. This publication too, can be obtained from any member of the MIA or from the office of the Institute.

**MARBLE INSTITUTE OF AMERICA, INC.
848 Pennsylvania Bldg., Washington, D.C. 20004**



Marble Institute of America

Incorporated

AMERICAN STANDARD SPECIFICATIONS FOR

- 1. Exterior Marble Veneer
2" and less in thickness**
- 2. Exterior Marble in
Curtain or Panel Walls**

MARBLE INFORMATION AND MARBLE SERVICE

The MARBLE INSTITUTE OF AMERICA, Incorporated, is an organization composed of Quarriers, Importers, Wholesalers, Finishers and Contractors of Marble, formed to establish and maintain the highest standards for the presentation of Marble and the quality of workmanship related to its use.

This Institute has accumulated a vast amount of information from the domestic and foreign Marble producing and finishing centers of the world, and as a result is in a position to give authentic, unbiased information regarding the commercially available Marbles of the world, to Architects, Engineers, Builders and others interested in Marble.

The Institute and its individual members are always available for consultation without obligation in connection with the selection, supply, finishing and installation of Marble.



marble classifications for soundness

1. As a result of knowledge gained in extensive practical experience of its members, the Marble Institute of America has classified Marbles into four groups. The basis of this classification is the characteristics encountered in finishing and the classification has no reference whatsoever to comparative merit or value. The classifications merely indicate what method of finishing is considered proper and acceptable in each instance, as based on trade usage.
2. These groupings — A, B, C and D — should be taken into account when specifying Marble, for all Marbles are not suitable for all building applications. This is particularly true for the comparatively more fragile Marbles classified under Groups C and D. They are as follows:

Group A: Sound Marbles and Stones, with uniform and favorable working qualities.

Group B: Marbles and Stones similar in character to the preceding group, but working qualities somewhat less favorable; occasional natural faults; limited amount of waxing and sticking necessary.

Group C: Marbles and Stones of uncertain variation in working qualities; geological flaws, voids, veins and lines of separation common; standard shop practice to repair Nature's variations by sticking, waxing and filling; liners and other forms of reinforcement freely employed when necessary.

Group D: Marbles and Stones similar to the preceding group and subject to the same methods of finishing and manufacture, but which contain a larger proportion of natural faults, and a maximum variation in working qualities; this group comprises many of the highly colored Marbles prized for their decorative qualities.

3. While the characteristics of the various Marbles are important in connection with the work of FINISHING the material, they do not indicate relative excellence and do not interfere to any great extent with the installation at the building. Only with Groups C and D is an exception made; the setting space and thickness should be increased if necessary, if liners are required for reinforcement.
4. To insure that all Marble specified is properly finished in accordance with the established standards of the industry, the Marble Institute of America recommends that architects and specification writers insist upon having all Marbles fabricated in this country where equipment and workmanship are the finest obtainable.
5. The official list of currently available Marbles together with the Soundness Classification for each is contained in a publication entitled MARBLE FORECAST. This publication, included in Sweet's Architectural Catalog File, can be obtained from any member of the Marble Institute of America, Inc. or from the office of the Institute at 848 Pennsylvania Bldg., Washington, D.C. 20004.

american standard specifications for thin exterior marble veneer (2" and less in thickness)



Marble Institute of America, Inc.: Edition 1955: Revised 1965.

These specifications have been adopted as American Standard A-94.2 — 1961; UDC 691.215; 624.022.

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1.0 general conditions

- .1 "The General Conditions of the Contract for the Construction of Buildings" (1963 Edition) issued by the American Institute of Architects, together with the Architect's Supplementary General Conditions of the Contract, form part of the Specifications binding the Marble Contractor who shall consult them in detail for instructions pertaining to his work.
- .2 Copies of the General Conditions and Supplementary General Conditions are on file and may be referred to at the office of the Architect where copies may be obtained.

NOTE: Marble work is performed as a sub-contract under the General contract. It is strongly recommended that Exterior Marble Work be treated as a separate section of the Architect's Specifications.

2.0 scope of the work

- .1 The work under this Contract includes the furnishing and erecting of all exterior Marble veneer shown on the Contract drawings and herein specified, together with all anchors for same.

3.0 conditions at the building

NOTE: This section may be omitted for projects of minor scope or complexity, or modified where items listed are included in the General Conditions.

- .1 The Marble Contractor shall report to the Architect, through the General Contractor, any conditions which prevent the Marble Contractor from performing his work properly.
- .2 The Marble Contractor shall be given without charge adequate storage and working space, with office space if required, for carrying on his work, free from rubbish or other interfering conditions.
- .3 The following items will be furnished by the General Contractor as specified in other sections of the Contract specifications:
 - .1 Metal supporting angles.
 - .2 Metal slots, boxes or other anchorages which are built into the structural wall.
 - .3 All scaffolding, centers and the like.
 - .4 Any required safety barricade or weather enclosure.
 - .5 Adequate hoisting facilities in multi-story buildings during regular working hours.
 - .6 Water, light and power at convenient locations on each floor.

- .7 Temporary heat, if enclosed.

NOTE: No exterior Marble veneer should be set in temperature below 40° Fahrenheit.

- .8 Temporary toilet facilities.
- .9 General cleaning of the building apart from cleaning by Marble Contractor. (See Section 16.)
- .10 Telephone facilities (but not unlimited free service).

4.0 kinds of marble

- .1 All Marble shall be (state names of Marble) conforming to or within the range of samples as approved by the Architect.
- .2 All exterior Group A Marble veneer shall be sound, dense and free from defects which might impair its strength or durability.
- .3 Where Group B, C and D Marbles are specified for decorative features, they shall be treated in accordance with "Marble Classifications for Soundness" ratings for B, C and D Marbles as defined by the Marble Institute of America, Inc. (See Definitions on page 5)
- .4 ALL MARBLE SHALL BE SELECTED FROM AVAILABLE STOCKS IN THIS COUNTRY, OR, IF IMPORTED, THE MARBLE SHALL BE DELIVERED IN THIS COUNTRY IN ROUGH FORM. ALL FINISHING INCLUDING SELECTION AND JOINTING TO SIZE, POLISHING, CUTTING AND CARVING SHALL BE EXECUTED IN THE UNITED STATES.

NOTE #1: Varieties selected should be specified by their trade names, not by Group Classifications.

NOTE #2: Decorative Marbles selected for exterior veneer require cleaning and maintenance for continued good appearance. Marble should be maintained as recommended in MIA's publication "The Cleaning and Maintenance of Marble".

NOTE #3: MIA cautions that all Marbles are not always suitable for unqualified use on all building exteriors. MIA member firms are prepared to cite instances of satisfactory service over extended periods of time in the same vicinity for those Marbles they recommend.

5.0 finishes

- .1 All exposed surfaces of Marble (state locations) shall be finished as follows: (State finish desired)

NOTE: Usual Finishes are:

Polish Finish:

A mirror-like glossy surface which brings out the full color and character of the Marble.

NOTE: This finish is not recommended for exterior use.

Hone Finish:

A velvety smooth surface with little or no gloss.

Sand and/or Abrasive Finish:

A flat, non-glossy surface usually recommended for exterior use.

- .2 All exposed surfaces shall be free from waves, projections or depressions, with the face of Marble in the same plane. Arrises shall be cut sharp and true to square or pattern and continuous with adjoining arrises.

6.0 samples

- .1 The Marble Contractor shall be prepared to furnish, through the General Contractor, for the Architect's approval a sufficient number of 8" x 12" samples of Marble, finished as specified which shall show range in quality, color and texture that will occur in the Marble to be used when requested to do so by the Architect. Where there is little variation in character an average single sample instead of a range may be submitted. The approved samples or sample shall become the standard for selection and finish of the Marble supplied under this contract.
- .2 Samples designating finished face shall be clearly labeled on the back with the name of the Marble, the Group Classification for Soundness, the name of the building, the use for which the Marble is intended, the names of the Architect, General Contractor, Marble Contractor and Marble Fabricator, and when approved shall be so identified.

7.0 shop drawings

- .1 The Architect will furnish or cause to be furnished, through the General Contractor to the Marble Contractor, all necessary scale drawings, large scale and full size details required, showing all Marble work and its relation to work of other trades. All such details will be consistent with the Contract Drawings.
- .2 The Marble Contractor shall promptly submit for the Architect's approval, through the General Contractor, Marble shop drawings in triplicate, showing general layout, jointing, anchoring, thickness of stock and other available dimensions. These shall be corrected as necessary and re-submitted until approval is complete and final. One copy shall be retained by the Architect and two copies returned to the General Contractor, one for his file and one for the Marble Contractor.

- .3 NO FABRICATION AFFECTED BY THE SHOP DRAWINGS SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY "APPROVED", OR "APPROVED AS NOTED".
- .4 After final approval and dimensioning of shop drawings, the Marble Contractor shall furnish the following:
 - Two prints for the Architect.
 - Two prints for the General Contractor.
 - One print for each affected trade.
- .5 All shop drawings shall show dimensions in feet and inches.

8.0 measurements

- .1 Before commencement of shop work on Marble, the Architect will establish for the Marble Contractor all governing measurements and note them on shop drawings, and they shall be guaranteed by the General Contractor.

9.0 cutting and fitting

- .1 The Marble Contractor shall do all the necessary cutting and fitting to accommodate his work to the work of other trades as called for on the approved shop drawings and by common usage in the trade. This work shall be done at the manufacturer's finishing shop whenever practicable.

10.0 extent and thickness

- .1 The extent of Marble veneer work shall be as indicated on the Contract drawings, or described herein. (List specific areas — base, facing, trim, entrances, coping and the like.)
- .2 Standard thicknesses for Marble for plain ashlar areas shall be ($\frac{7}{8}$ " ($1\frac{1}{4}$ " ($1\frac{1}{2}$ " (2 ") thick (say which); and stock of greater thickness may be provided for pilasters, trim and special features as indicated on contract drawings.

NOTE #1: In general, the greater thicknesses are suggested for multi-story projects, or where the design calls for large individual pieces, or climatic conditions are severe. For small projects, such as store fronts and for projects calling for comparatively small individual pieces, the specification of $\frac{7}{8}$ " may be entirely proper.

NOTE #2: Designs calling for large sizes should be carefully checked with the Marble Contractor for size restrictions of the Marble proposed.



NOTE #3: All thicknesses are nominal unless otherwise specified.

11.0 jointing

- .1 Jointing of exterior Marble veneer work shall be as shown on contract drawings and as further developed on approved shop drawings.
- .2 Where $\frac{7}{8}$ " Marble is used in wall areas, joints may be $\frac{1}{16}$ " or $\frac{1}{8}$ ", buttered or filled solidly, preferably with non-staining elastic jointing compound (polysulfide or similar synthetic rubber base, or regular mastic type) or with cement lime mortar. Jointing compound should be of a color chosen for its compatibility with the color of the Marble used. Weight bearing joints shall be maintained by plastic or aluminum cushions.
- .3 Thicknesses of (1 $\frac{1}{4}$ ") (1 $\frac{1}{2}$ ") and (2") (say which) shall have joints of a minimum of $\frac{3}{16}$ " solidly buttered with non-staining elastic jointing compound, maintaining weight bearing joints by plastic or aluminum cushions.

ALTERNATE TO .3:

Thicknesses of (1 $\frac{1}{4}$ ") (1 $\frac{1}{2}$ ") and (2") shall have joints of a minimum of $\frac{3}{16}$ " filled solidly with non-staining setting mortar, then raked out to a depth of at least $\frac{1}{2}$ " and pointed uniformly with non-staining cement lime mortar or non-staining pointing compound.

- .4 Expansion-Contraction:
 - .1 In large areas of exterior Marble veneer, or where there are long "runs," such as coping, spandrel belts, or column or pilaster facings, provision shall be made for thermal expansion and contraction. For large areas of ashlar veneer, one such joint shall be provided horizontally on at least every other story height, and one vertically at intervals of about 20 feet. For coping and spandrel belt courses, expansion joints shall be provided not to exceed every 20 feet of the "run". All joints shall be located and detailed by the Architect on the contract drawings.
 - .2 Expansion-Contraction joints shall be a minimum of $\frac{3}{8}$ " in width, shall be back-filled with an inert type resilient material such as cotton rope, sponge rubber or plastic to not more than $\frac{1}{2}$ the depth of the joint, and the remaining front half filled solid, preferably with a polysulfide

or similar synthetic rubber base nonstaining caulking compound approved by the Architect. Where horizontal expansion-contraction joints are required at locations where the weight of super-imposed materials might tend to squeeze out resilient pointing materials, load bearing resilient spacers of hard rubber, neoprene or similar non-staining materials shall be provided to prevent squeezing out of the jointing compound and to maintain the proper joint width. Horizontal Expansion-Contraction joints shall be located directly beneath relieving angles when such angles occur at each story height.

- .3 Jointing compounds shall not stain the Marble or corrode metals, or be affected adversely by long exposure to extremes of sunlight, atmosphere or temperature. Jointing compounds shall be factory mixed and used strictly in accordance with manufacturer's instructions.
- .4 Special patented metal expansion joints incorporating both the necessary resilience and load bearing qualities shall be provided by others if required.
- .5 Caulking mastics of the oil resin base type shall meet the requirements of Federal Specification TT-C-598.

12.0 supports

- .1 Marble veneer shall be supported by horizontal angles and attachments furnished and securely fastened to the building by the General Contractor.

NOTE: Where these angles and attachments are in direct contact with Marble they shall be of non-corrodible metal. Short clip angles are preferred to continuous angles to insure proper alignment.

- .2 These angle supports shall be located as shown on the contract drawings or the shop drawings and in general will be required over all openings and at each story height or not more than 20' apart in vertical spacing. Where there are no window openings, support shall be given along one horizontal line per story height. The same applies to pilasters and other vertical facings.
- .3 Marble veneer shall not be depended upon to support vertical loads other than the veneer material above it. Letters, signs and other appliances applied to the Marble wall shall be so hung that their weight shall not

bear on the Marble but shall be supported by hangers set in the supporting wall, and all such letters, signs, hangers, fastenings and the like shall be of material and design that cannot stain or damage the Marble.

13.0 setting and anchorage

- .1 All Marble shall be cleaned on the face, back and edges before setting, removing any foreign matter that might impair the bedding, bonding or appearance of the work. During setting operations any dirt or setting materials in contact with exposed surfaces of the Marble shall be immediately removed.
- .2 Anchoring of the Marble shall be as shown on the contract drawings and in such a manner as to secure the veneer permanently in place.
- .3 It shall be the responsibility of the Marble Contractor to anchor all Marble securely. In general for standing Marble, the following practices usually prevail:
 - .1 A minimum of 2 anchors shall be required on all pieces up to 2 square feet in area.
 - .2 A minimum of 4 anchors shall be required on all pieces up to 20 square feet in area.
 - .3 A minimum of 2 additional anchors shall be required on each additional 10 square feet.

NOTE: For earthquake areas, refer to building codes in such areas for special anchorage requirements. In all areas, anchorage must be positive and mechanical and shall not rely in whole or in part on "bond" provided by mortar spots around anchors and between Marble and backup wall.

14.0 setting materials and methods

NOTE: Numerous alternates are given in the following subparagraphs to cover various types of construction identified herein as:

Type A) Veneer setting against prebuilt masonry wall.

Type B) Veneer setting concurrent with masonry back-up wall.

Type C) Veneer setting against reinforced concrete or masonry wall, where required by the building code.

The Specification Writer should choose those paragraphs which are applicable to the type of construction of his particular project.

- .1 For types (A) or (B) kind of anchors:

Wire anchors shall be of stainless steel, brass, medium hard drawn copper, or other non-corrodible metal at least $\frac{1}{8}$ " in diameter.

- .1 For type (C) kind of anchors:

Anchors shall be of stainless steel, brass, bronze or other non-corrodible metal and of the dove-tail or T-tail type as shown on the contract drawings.
- .2 For type (A) treatment of back-up wall behind Marble:

The back-up walls behind all veneer pieces shall be thoroughly coated with approved damp-proofing or waterproofing paint (applied by the General Contractor) before marble is set.
- .2 For type (B) treatment of back of Marble:

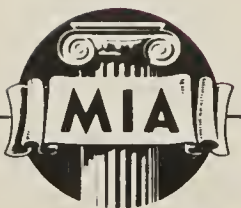
As the veneer is set, all marble pieces shall be completely parged on the back with non-staining cement mortar.
- .2 For type (C) treatment of back of Marble:

Backs of veneer pieces to be solid-grouted shall not be damp-proofed nor treated with any material which would tend to impair bonding of the grout to the slab.
- .3 For type (A) installation of anchors:

Anchors shall be attached to the Marble by being hooked or embedded in holes $\frac{3}{4}$ " deep in the edges of the piece, parallel to the face and equidistant from front and back faces. The hole shall then be filled with non-staining cement mortar, mixed in the following proportions: one (1) part non-staining Portland Cement, three (3) parts clean sharp sand, one-fifth ($\frac{1}{5}$) part hydrated lime based on cement volume, all dry mixed. Water shall be added until a plastic mix has been obtained. Attachment to the wall shall be made by inserting the anchor into a hole in the backing, shaped to receive and retain it, and filled with nonstaining accelerated cement mortar.
- .3 For type (B) installation of anchors:

Anchors shall be attached to the Marble by being hooked or embedded in holes $\frac{3}{4}$ " deep in the edges of the piece, parallel to the face and equidistant from front and back faces. The holes shall then be filled with non-staining cement mortar. Wall-ends of the anchors shall be bent and securely built into the masonry back-up construction.
- .3 For type (C) installation of anchors:

A system of non-corrodible metal slots or boxes built into the concrete wall by the General Contractor and non-corrodible dove-tail or T-tail wall ties or anchors, properly



fitted and satisfactory to the Architect, embedded in the edge of the veneer pieces, shall be used.

.4 For type (A) air space and spots:

Allow at least 1", but not more than 1 1/2", clearance back of veneer and set each piece rigidly against spots of non-staining cement mortar with accelerator, located at or near the anchors and spaced not further than 18" apart over the back of each piece. (See Notes #1 and #2 below.)

.4 For type (B) masonry back-up:

Parged slabs shall be erected in place and maintained in proper alignment, and shall be backed up with the masonry materials specified, all anchors being securely built in as the wall construction progresses.

NOTE #1: Where Marble is to be set on or immediately above the foundation, the foundation should be damp-proofed on top. An air space of 1" above the foundation and 1" behind the Marble shall be provided to avoid traveling of moisture.

NOTE #2: The above method is the generally accepted practice but owing to conditions in different localities throughout the country, some building codes call for solid grouted space between the Marble veneer and the masonry wall. If grouting is required, grout should be of non-staining cement and clean washed sand poured after each course of veneer is set in place to a depth that will not affect alignment, (6" for 1 1/4" or thinner, 10" for 1 1/2" or thicker) rodded or puddled and allowed to set enough to carry the weight of the next pour.

NOTE #3: Where grouting is required, waterproofing should be omitted from back of Marble.

.4 For type (C) solid grouting — (If required by building code):

Allow at least 1" clearance between back of veneer and concrete or masonry wall and grout this space full with non-staining cement grout mixed as follows: 1 part non-staining white water-proof cement, 3 parts clean washed, well graded, mason's river sand up to 1/4" size, maximum water 6 1/2 gallons per sack of cement. Grout is to be poured after each course of veneer is set in place to a depth that will not affect alignment (6" for 1 1/4" or thinner and 10" for 1 1/2" or thicker) rodded and puddled and allowed to set enough to carry the weight of the next pour. Joints shall be buttered full with white cement lime mortar mixed as follows: 1 part non-staining white water-proof Portland cement, 2 parts white silica sand #40, sufficient lime

putty (under 15%) to make as stiff as can be worked, 3 1/2 gallons of water per sack of cement including moisture in aggregate.

15.0 flashing

(FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR)

- .1 A completely waterproof installation must be provided.

16.0 cleaning

- .1 Upon completion of the various portions of this work, the Marble Contractor shall remove all unused surplus materials, rubbish, debris, and the like, in connection with his contract and shall give the Marble a thorough cleaning with a fibre brush and clear water to the satisfaction of the Architect. No acids or harsh abrasive cleaners or steel wire brushes shall be used.

17.0 building codes

NOTE: ALL THE ABOVE SPECIFICATIONS ARE SUBJECT TO CORRECTION TO CONFORM TO LOCAL BUILDING CODES.



american standard specifications for thin exterior marble in curtain or panel walls

Marble Institute of America, Inc.: Edition 1955; Revised 1965.

*These specifications have been adopted as American
Standard A-94.3 — 1961; UDC 691.215; 624.022.*

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1.0 general conditions

- .1 "The General Conditions of the Contract for the Construction of Buildings" (1963 Edition) issued by The American Institute of Architects, together with the Architect's Supplementary General Conditions of the Contract, form a part of these Specifications binding the Marble Contractor who shall consult them in detail for instructions pertaining to his work.
- .2 Copies of the General Conditions and Supplementary General Conditions are on file and may be referred to at the office of the Architect where copies may be obtained.

NOTE: Marble work is performed as a sub-contract under the general contract. It is strongly recommended that Exterior Marble work be treated as a separate section of the Architect's Specifications.

2.0 scope of the work

- .1 The Marble Contractor shall provide, install and erect all exterior Marble for curtain or panel walls as shown on the contract drawings and as herein specified, together with all anchors for same.

3.0 conditions at the building

NOTE: This section may be omitted for projects of minor scope or complexity, or modified where items listed are included in the General Conditions.

- .1 The Marble Contractor shall report to the Architect, through the General Contractor, any conditions which prevent the Marble Contractor from performing his work properly.
- .2 The Marble Contractor shall be given without charge adequate storage and working space with office space if required, for carrying on his work, free from rubbish or other interfering conditions.
- .3 The following items will be furnished by the General Contractor as specified in other sections of the Contract Specifications:
 - .1 Metal frame work and supporting angles.
 - .2 Metal slots, boxes or other anchorages which are built into the structural wall.
 - .3 All scaffolding, centers and the like.
 - .4 Any required safety barricade or weather enclosure.
 - .5 Adequate hoisting facilities in multi-story buildings during regular working hours.
 - .6 Water, light and power at convenient locations on each floor.

- .7 Temporary heat, if enclosed.
- .8 Temporary toilet facilities.
- .9 General cleaning of the building apart from cleaning by Marble Contractor (See Section 14).
- .10 Telephone facilities (but not unlimited free service).

4.0 kinds of marble

- .1 All Marble shall be (state names of Marble) conforming to or within the range of samples as approved by the Architect.
- .2 All exterior Group A Marble shall be sound, dense and free from defects which might impair its strength or durability.
- .3 Where Group B, C and D Marbles are specified for decorative features, they shall be treated in accordance with "Marble Classifications for Soundness" ratings for B, C and D Marble as defined by the Marble Institute of America, Inc.
(See Definitions on page 5).
- .4 ALL MARBLE SHALL BE SELECTED FROM AVAILABLE STOCKS IN THIS COUNTRY, OR, IF IMPORTED, THE MARBLE SHALL BE DELIVERED IN THIS COUNTRY IN ROUGH FORM. ALL FINISHING INCLUDING SELECTION AND JOINTING TO SIZE, POLISHING, CUTTING AND CARVING SHALL BE EXECUTED IN THE UNITED STATES.

NOTE #1: Varieties selected should be specified by trade names, not by Group Classification.

NOTE #2: For curtain or panel wall construction when it is in frames a sound Marble should be used.

NOTE #3: MIA cautions that all Marbles are not always suitable for unqualified use on all building exteriors. MIA member firms are prepared to cite instances of satisfactory service over extended periods of time in the same vicinity for those Marbles they recommend.

5.0 finishes

- .1 All exposed surfaces of Marble (state locations) shall be finished as follows: (State finish desired)

NOTE: Usual Finishes are:

Polish Finish:

A mirror-like glossy surface which brings out the full color and character of the Marble.

NOTE: This finish not recommended for exterior use.

Hone Finish:

A velvety smooth surface with little or no gloss.

Sand and/or Abrasive Finish:

A flat, non-glossy surface usually recommended for exterior use.

- .2 All exposed surfaces shall be free from waves, projections or depressions, with the face of Marble in the same plane. Arrises shall be cut sharp and true to square or pattern and continuous with adjoining arrises.

6.0 samples

- .1 The Marble Contractor shall be prepared to furnish, through the General Contractor, for the Architect's approval a sufficient number of 8" x 12" samples of Marble, finished as specified, which shall show range in quality, color and texture that will occur in the Marble to be used when requested to do so by the Architect. Where there is little variation in character an average single sample instead of a range may be submitted. The approved samples or sample shall become the standard for selection and finish of the Marble supplied under this contract.
- .2 Samples designating finished face shall be clearly labeled on the back with the name of the Marble, the Group Classification for Soundness, the name of the building, the use for which the marble is intended, the names of the Architect, the General Contractor, the Marble Contractor and the Marble Fabricator, and when approved shall be so identified.

7.0 shop drawings

- .1 The Architect will furnish or cause to be furnished through the General Contractor to the Marble Contractor all necessary scale drawings, large scale and full size details required, showing all Marble work and its relation to work of other trades. All such details will be consistent with the Contract Drawings.
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two copies returned to the General Contractor, one for his file and one for the Marble Contractor.

- .3 NO FABRICATION AFFECTED BY THE SHOP DRAWINGS SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY "APPROVED", OR "APPROVED AS NOTED".
- .4 After final approval and dimensioning of shop drawings, the Marble Contractor shall furnish the following:

Two prints for the Architect.

Two prints for the General Contractor.

One print for each affected trade.

- .5 All tolerances and clearances shall be clearly shown.
- .6 All shop drawings shall show dimensions in feet and inches.

8.0 measurements

- .1 Before commencement of shop work on Marble, the Architect will establish for the Marble Contractor all governing measurements and note them on shop drawings, and they shall be guaranteed by the General Contractor.

9.0 cutting and fitting

- .1 The Marble Contractor shall do all necessary cutting and fitting to accommodate his work to that of other trades as called for on approved shop drawings and by common usage in the trade. This shall be done at the manufacturer's finishing shop whenever practicable.

10.0 extent and thickness

- .1 The extent of marble work for curtain or panel walls shall be as indicated on the Contract Drawings or as described herein. (List specific areas such as Spandrels, Column Facings and the like.)
- .2 Thickness of marble shall be ($\frac{7}{8}$ ") (1 $\frac{1}{4}$ ") (1 $\frac{1}{2}$ ") or (2") thick. (Say which)

NOTE #1: In general the greater thicknesses are recommended where larger surface areas are desired or where additional strength is required to resist stresses on the panel.

NOTE #2: Designs calling for large sizes should be carefully checked with the Marble Contractor for size restrictions of the Marble proposed.

NOTE #3: All thicknesses are nominal unless otherwise specified.



11.0 supports

- .1 The weight of Marble shall be fully supported by the metal frame and no weight shall be allowed to bear upon the Marble.

12.0 setting and anchorage

- .1 All setting materials or foreign matter of any kind shall immediately be cleaned from the face of the Marble both before and during the process of setting.
- .2 Marble in curtain or panel walls shall be set on and completely supported by non-staining and non-corrodible metal frames (including strips, angles and battens) specified in section (state the name of the appropriate section in the Architect's Specifications). The portion of this frame attached to the building structure shall be set in place by the General Contractor but the strips, angles and battens for securing the Marble in place in the frames shall be set by the Marble Contractor including the caulking.

13.0 caulking

- .1 Edges of Marble slabs shall not be allowed to rest directly upon the metal framework. Weight bearing edges shall rest upon compressible non-staining cushions of proper thickness and so spaced as to maintain proper clearances.
- .2 All edges including adjoining surface covered by frame shall be caulked or pointed with non-staining caulking compound. This compound shall be approved by the Architect. It shall not stain the Marble or corrode metals nor be affected by long exposure to extremes of outside temperatures. It shall be factory mixed and used strictly in accordance with the manufacturer's instructions. Caulking of the oil base resin type shall meet the requirements of Federal Specification TT-C-598.

NOTE: Metal frame should be designed to allow access from the outside face. Initial setting, however, should be done from the back.

14.0 cleaning

- .1 Upon completion of the various portions of this work, the Marble Contractor shall remove all unused surplus materials, rubbish, debris and the like, in connection with his contract and shall give the Marble a thorough clean-

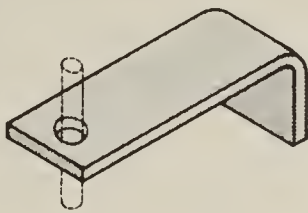
ing with a fibre brush and clear water to the satisfaction of the Architect. No acids, or harsh abrasive cleaners or steel wire brushes shall be used.

15.0 building codes

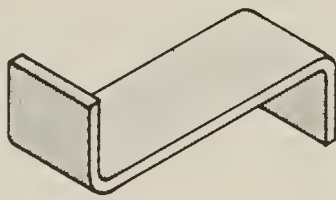
NOTE: ALL THE ABOVE SPECIFICATIONS ARE SUBJECT TO CORRECTION TO CONFORM TO LOCAL BUILDING CODES.

index to detail plates

Anchors Used in Marble Work	Plate E 1
Hanging of Exterior Marble Soffits	Plate E 2
Marble Treatment for Copings	Plate E 3
Marble Veneer Ashlar Wall Facing	Plate E 4
Tying Back Exterior Marble Wall Facings	Plate E 5
Supporting Exterior Marble Wall Facings	Plate E 6
Marble Treatment for Store Front	Plate E 7
Marble Treatment for Curtain Wall	Plate E 8
Marble Treatment for Curtain Wall	Plate E 9
Marble Treatment for Curtain Wall	Plate E 10
Marble Treatment for Curtain Wall	Plate E 11
Marble Treatment for Curtain Wall	Plate E 12
Marble Faced Precast Reinforced Concrete Building Panels	Plate E 13
Marble Treatment for a Building Facade	Plate E 14



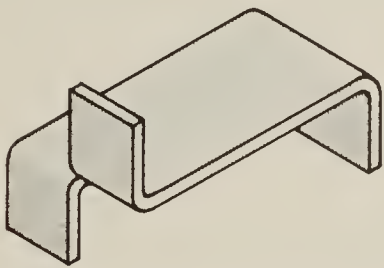
L STRAP
with hole for dowel



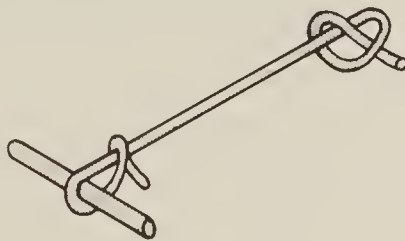
Z CRAMP STRAP



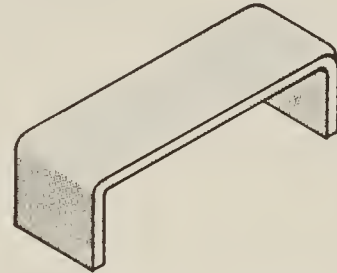
TWISTED STRAP
for vertical edge
anchors



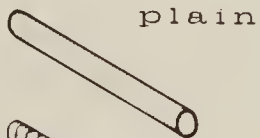
2 WAY CRAMP STRAP



WIRE TIEBACK
with dowel



U CRAMP STRAP

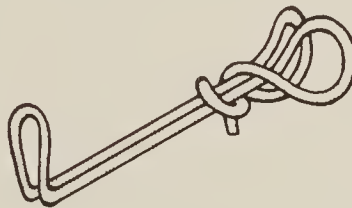


plain

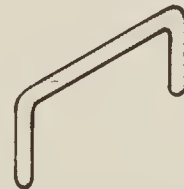


threaded

DOWELS

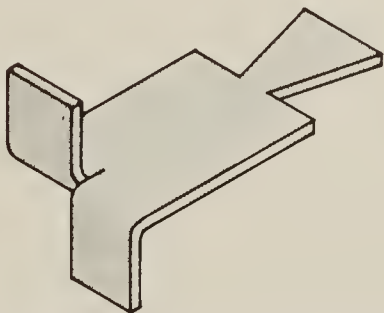


WIRE TIEBACK
inserted & cemented
in wedge shaped holes
made in masonry

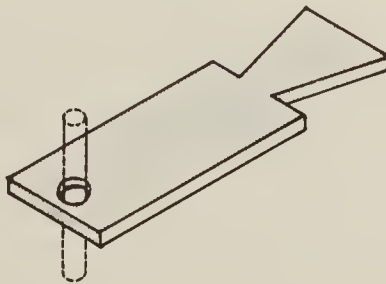


WIRE CRAMP

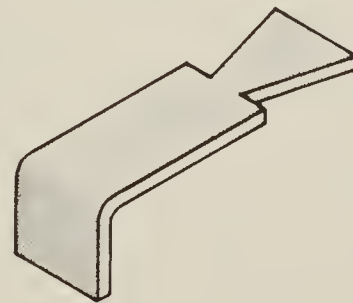
TYPES OF WIRE AND STRAP ANCHORS



DOVETAIL 2 WAY STRAP



DOVETAIL STRAP
with hole for dowel



DOVETAIL L STRAP

TYPES OF DOVETAIL ANCHORS

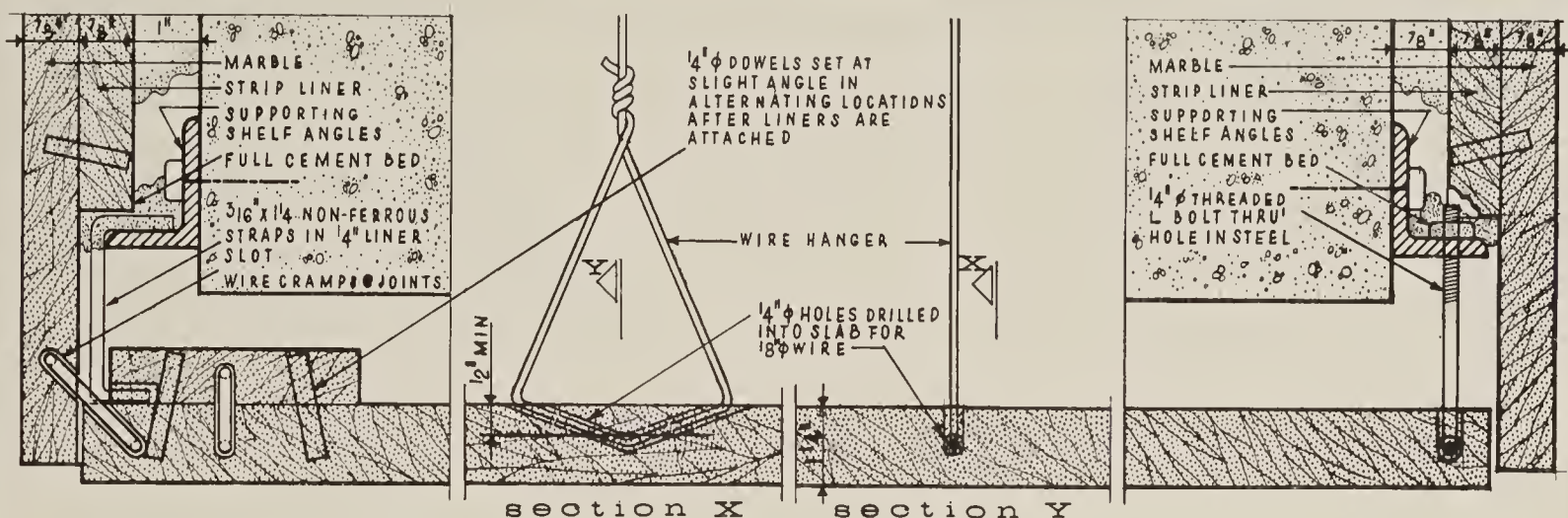
NOTE: ALL ANCHORS AND ATTACHMENTS ARE TO BE RUST-RESISTANT AND CORROSION RESISTANT METALS



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ANCHORS USED
IN MARBLE WORK

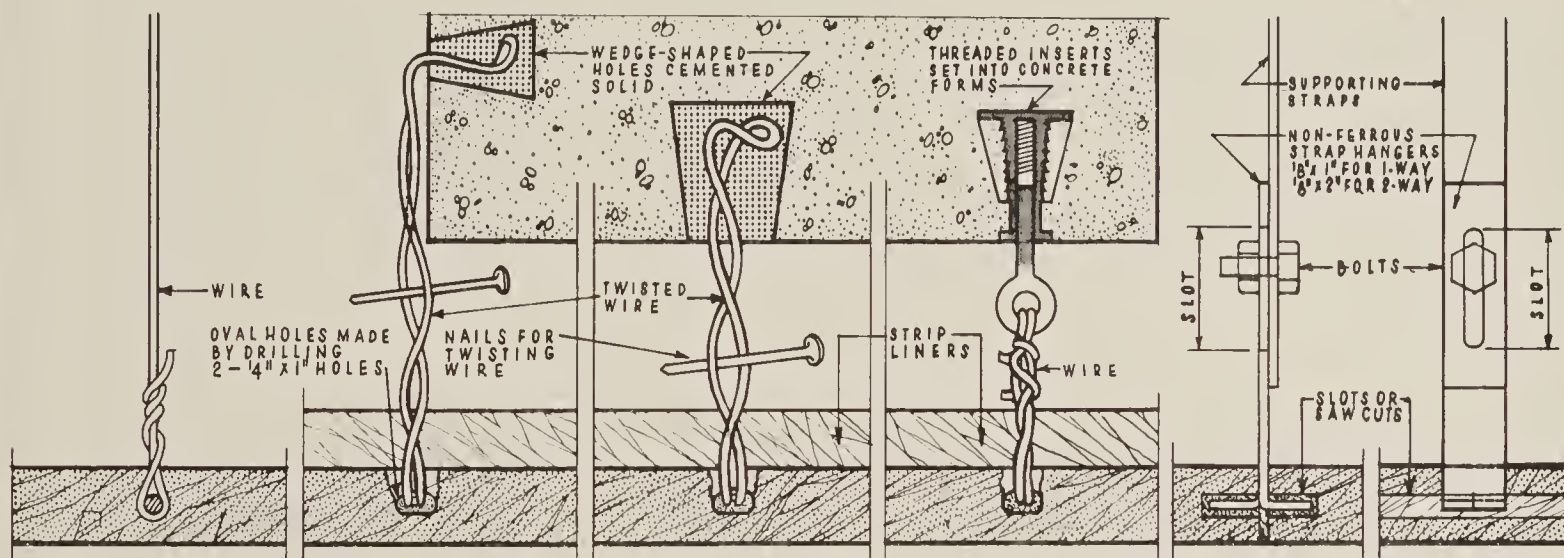
PLATE E1
EXTERIOR



DETAIL A
supporting soffit
and corner with
strap anchors

DETAIL B
supporting soffit
with wire thru slab

DETAIL C
supporting soffit
and corner with
rod hangers



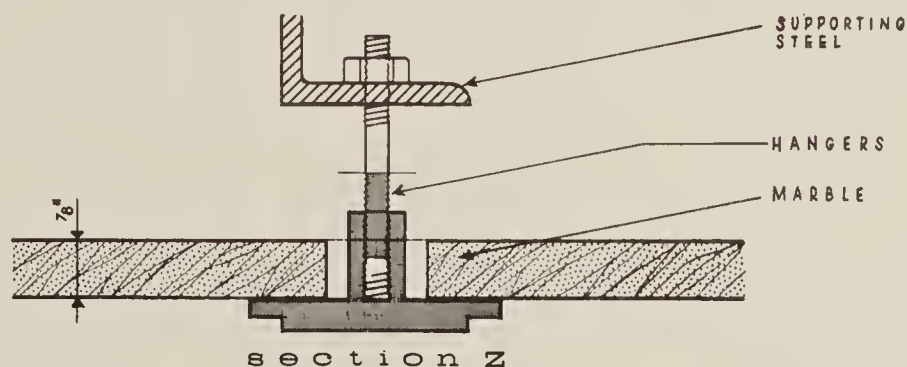
DETAIL D
wire twisted
around $3/16"$
threaded
dowels $1\frac{1}{2}'$ long

DETAIL E
twisted wire in
face of beam

DETAIL F
twisted wire in
soffit of beam

DETAIL G
twisted wire in
adjustable eye

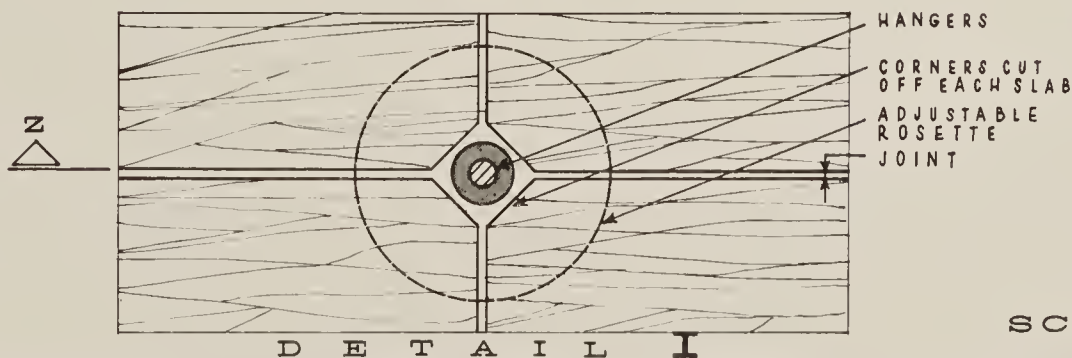
DETAIL H
adjustable straps and
bolts in slots or saw cuts



section Z

NOTE NO. 1
ALL ANCHORS AND
ATTACHMENTS ARE TO BE
OF RUST RESISTANT AND
CORROSION RESISTANT
METALS

NOTE NO. 2
THE FREE ENDS OF
SOFFITS IN DETAILS
A, B & C ABOVE SHALL BE
HUNG AS PER DETAILS
D, E, F, G OR H



DETAIL I

adjustable rosettes supporting equally the corners of four slabs

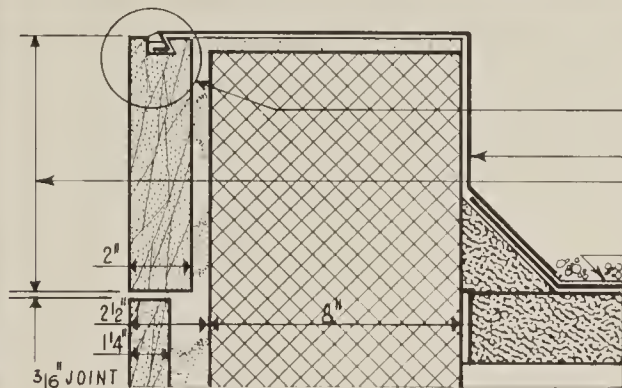
SCALE: 3"=1'-0"



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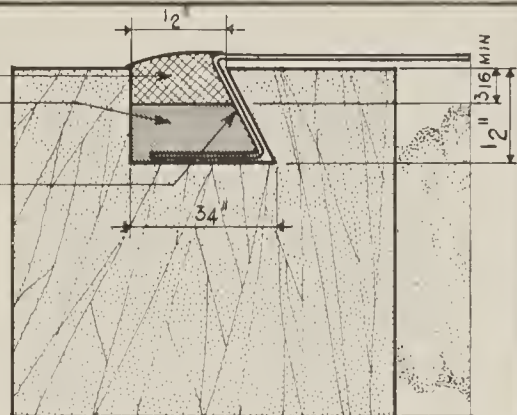
**HANGING OF EXTERIOR
MARBLE SOFFITS**

**PLATE E2
EXTERIOR**



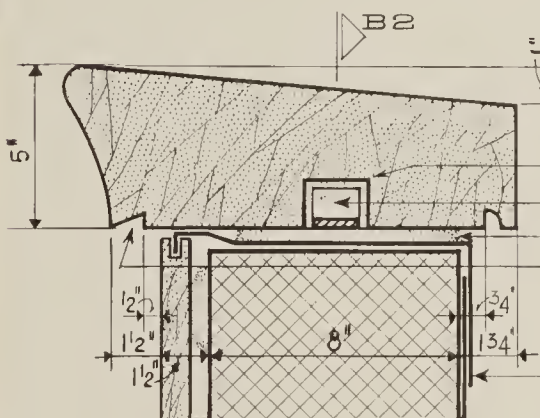
SECTION

SYNTHETIC RUBBER SEALANT
POURED LEAD WEDGE
SEE DETAIL "A"
CONTINUOUS FLASHING
HEIGHT OF THIS COURSE
CAN BE THE SAME AS
LOWER COURSES
BUILT-UP ROOFING



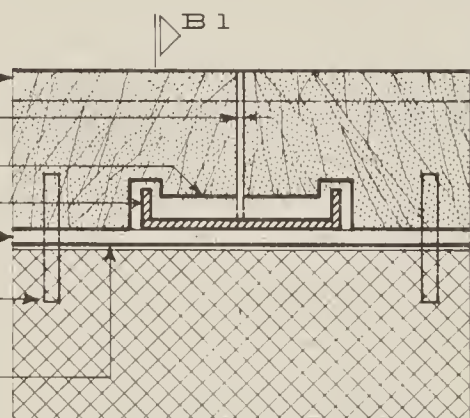
DETAIL A

DESIGN NO. 1



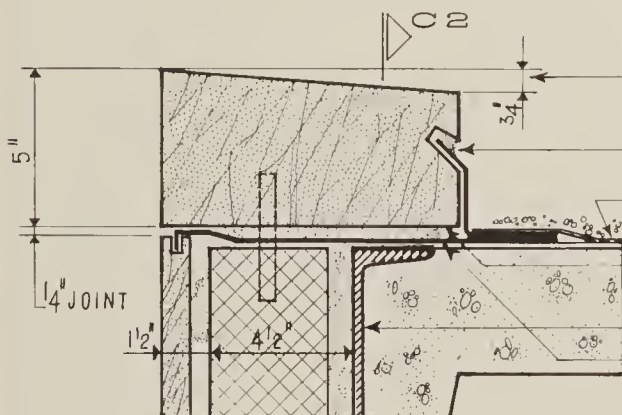
SECTION B1

WASH
1/8" JOINT
SLOT
NON-FERROUS CRAMPS
FULL CEMENT BED
DRIP
THE USE OF DOWELS WITH
CRAMPS IS OPTIONAL
CONTINUOUS FLASHING



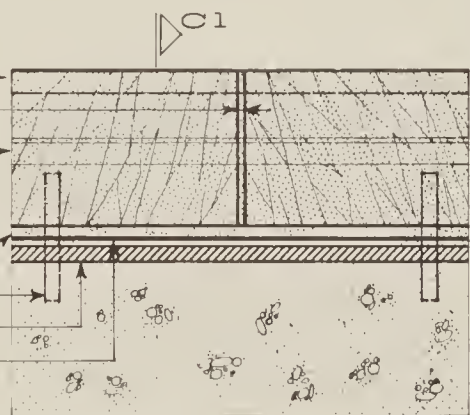
SECTION B2

DESIGN NO. 2



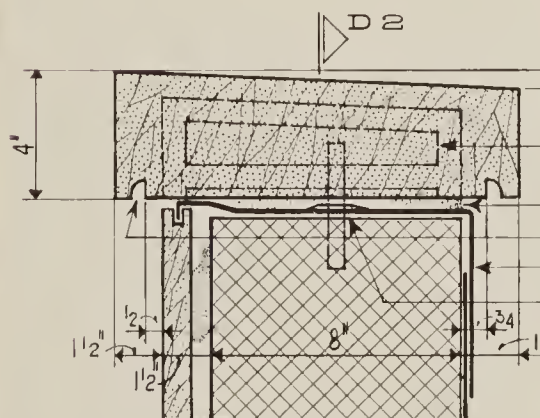
SECTION C1

WASH
1/8" JOINT
CAULKED FLASHING RABBET
AND FLASHING
BUILT-UP ROOFING
FULL CEMENT BED
NON-FERROUS DOWELS
STRUCTURAL STEEL AT ROOF
CONTINUOUS FLASHING



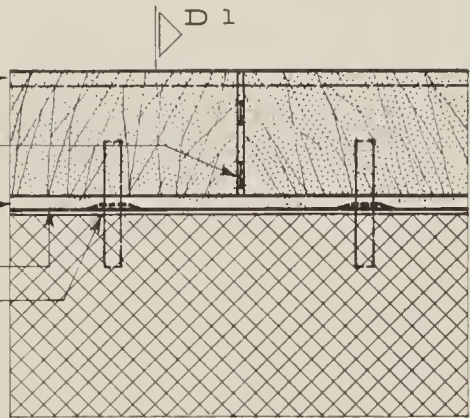
SECTION C2

DESIGN NO. 3



SECTION D1

WASH
RESILIENT EXPANSION
GASKET
FULL CEMENT BED
DRIP
CONTINUOUS FLASHING
1/2" SQ. DOWELS SOLDERED
AT HOLES IN FLASHING



SECTION D2

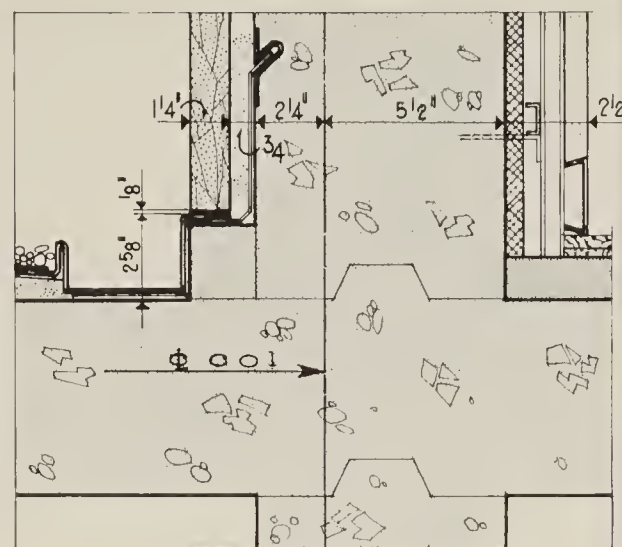
DESIGN NO. 4



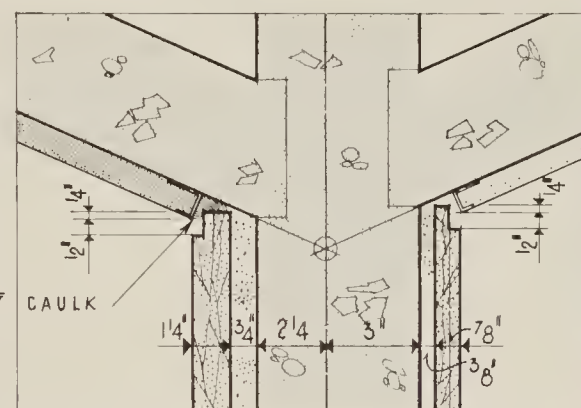
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MARBLE TREATMENT
FOR COPINGS

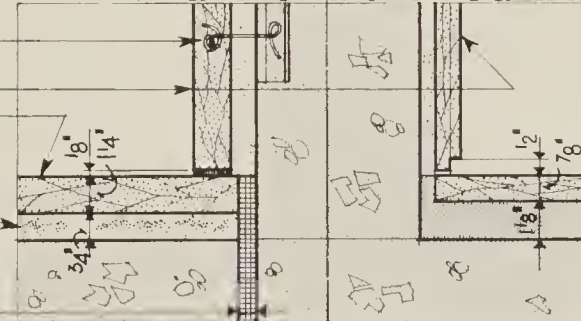
PLATE E3
EXTERIOR



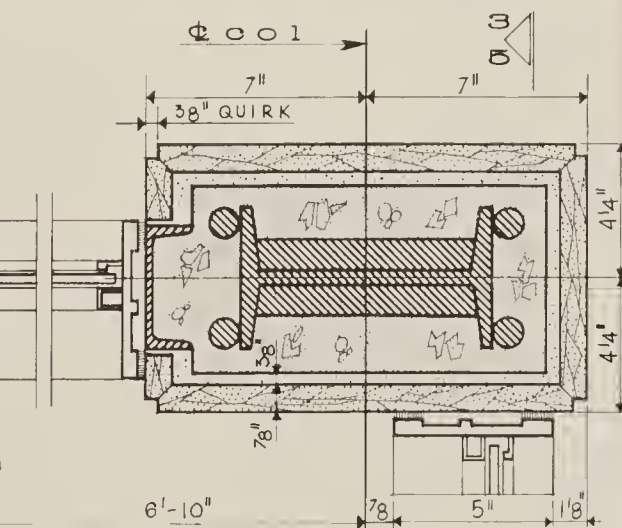
S E C T I O N 1



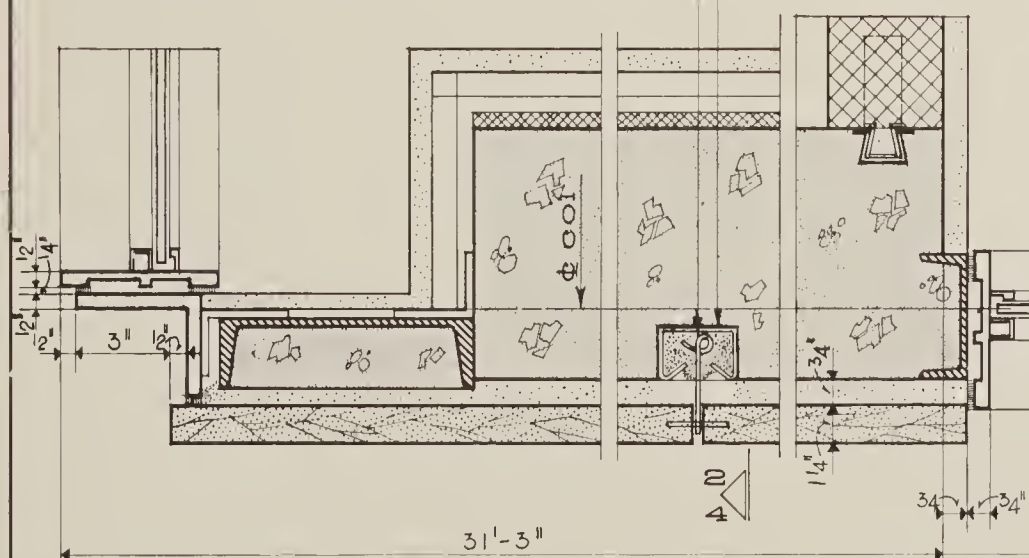
SECTION 2. SECTION 3
at wall at column



SECTION 4 SECTION 5
a t w a l l a t c o l u m n



S E C T I O N 9



S E C T I O N 6 S E C T 7 S E C T 8

scale: $1^1 2'' = 1' - 0''$

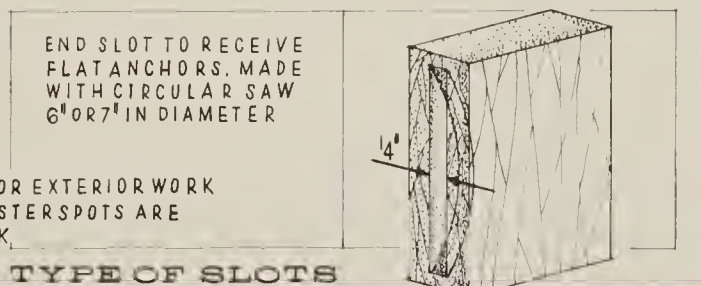
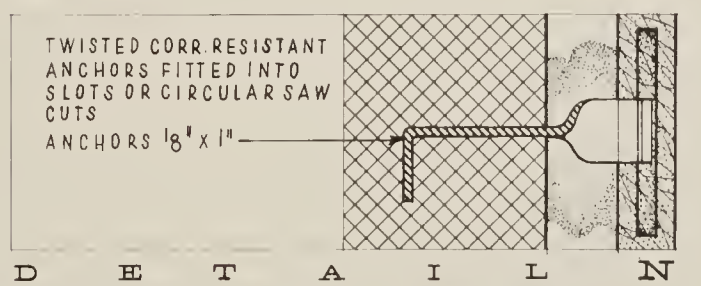
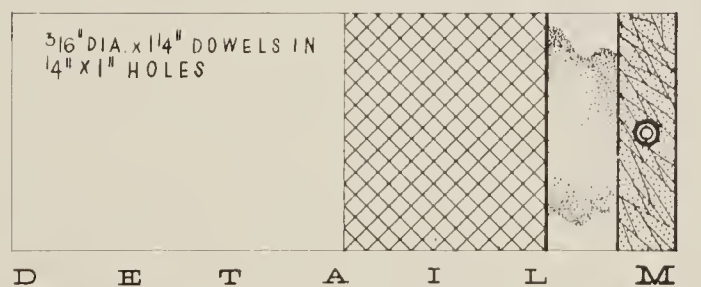
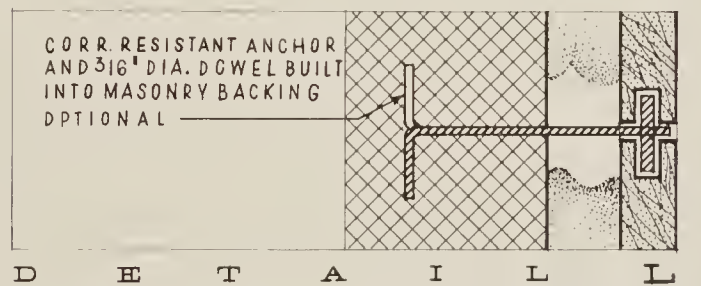
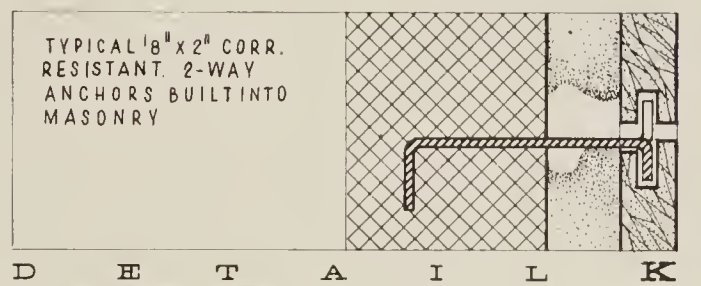
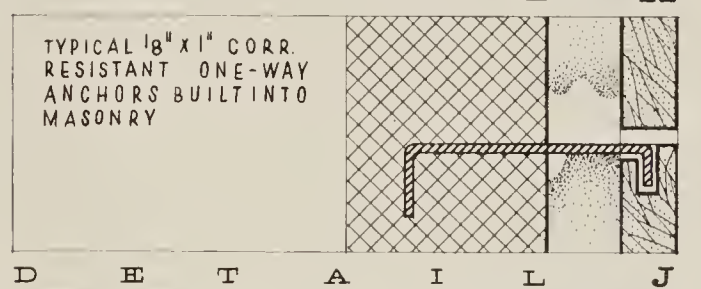
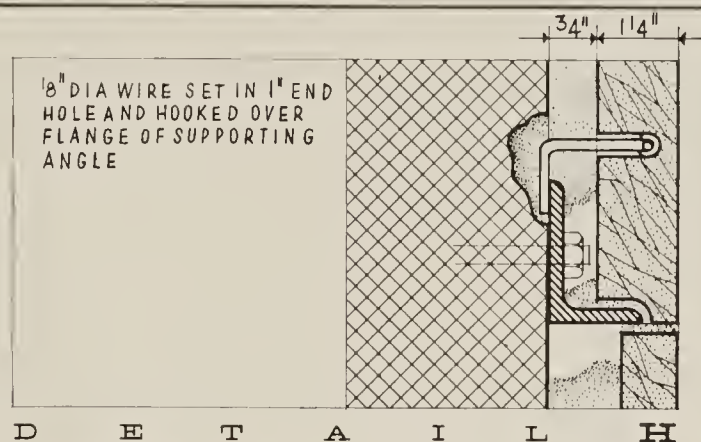
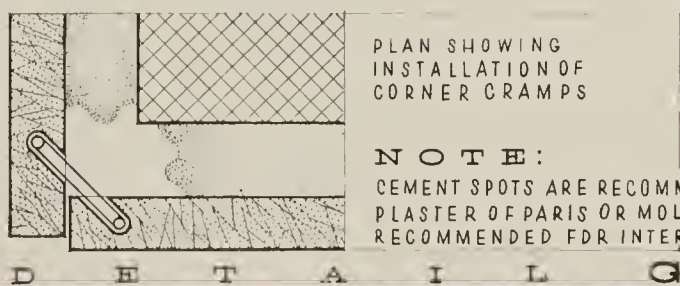
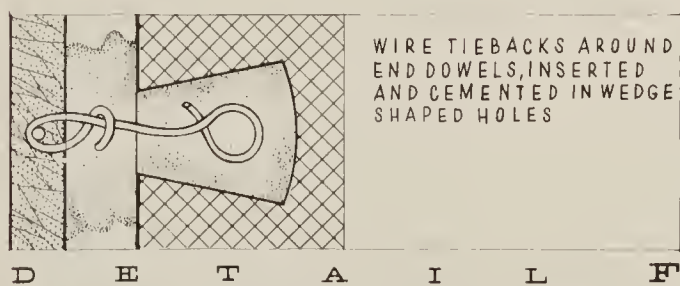
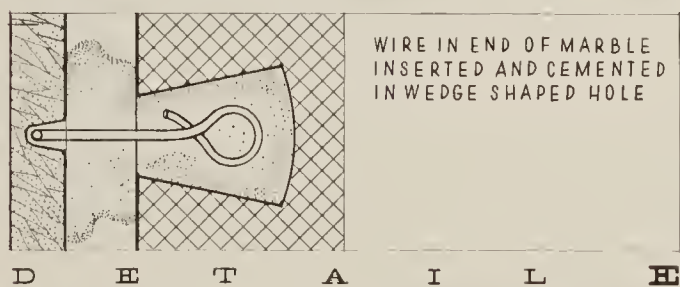
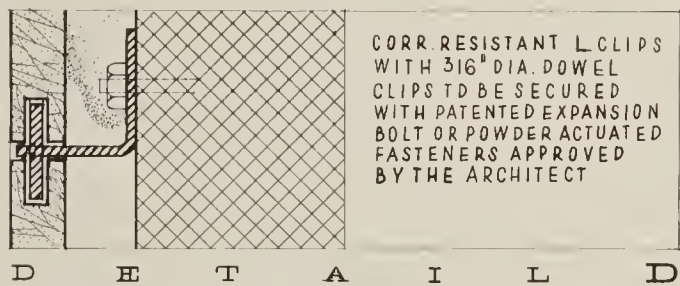
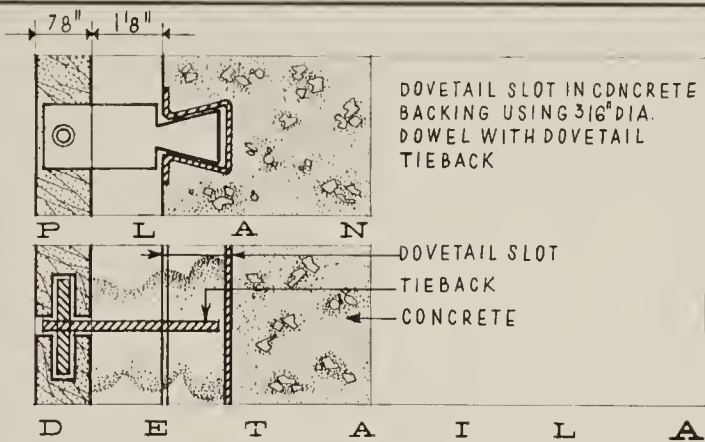
DETAIL FROM MC GREGOR MEMORIAL COMMUNITY CONFERENCE CENTER, WAYNE UNIVERSITY, DETROIT MICH.-ARCH-YAMASAKI, LEINWEBER & ASSOCIATES



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MARBLE VENEER
ASHLAR WALL FACING

PLATE E4
EXTERIOR



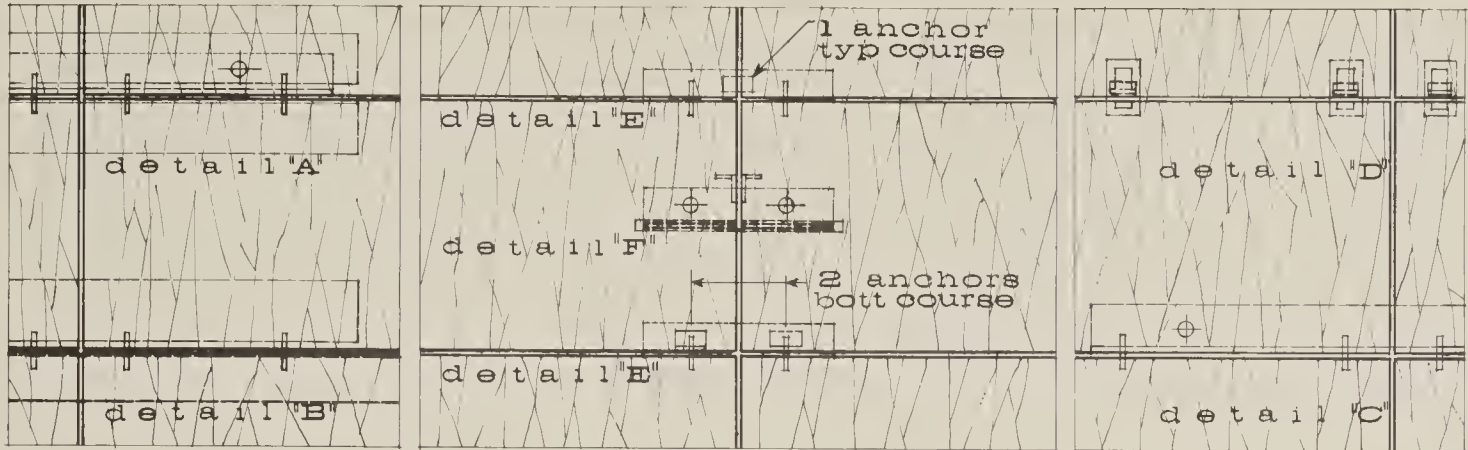
3" - 1'-0"



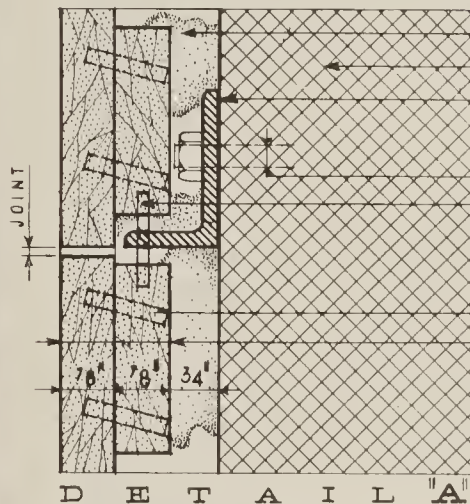
Marble Institute
of America, Inc.

TYING BACK EXTERIOR
MARBLE WALL FACINGS

PLATE E5
EXTERIOR

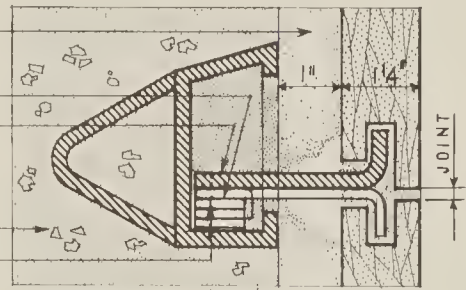


K E Y E L E V A T I O N



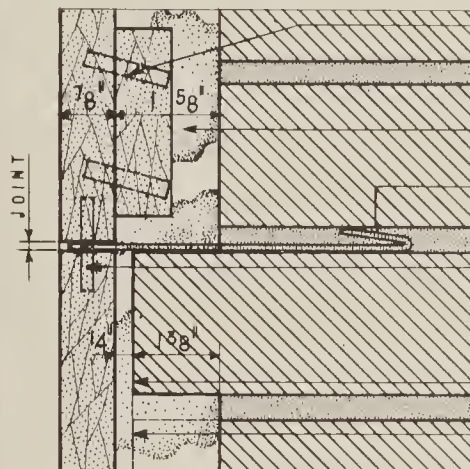
D E T A I L "A"

- CEMENT SPOTS OR SETTING PADS
- MASONRY BACKING
- SHELF ANGLE
- EXPANSION OR OTHER TYPE BOLTS
- 3/16" PINS DROPPED THRU ANGLE HOLES TO ACT AS TIEBACKS FOR THE UPPER AND LOWER MARBLE SLAB
- 1/4" DOWELS (SEE NOTE)
- MARBLE & MARBLE LINERS
- C.I. BOX TYPE INSERTS SET AGAINST CONCRETE FORMS TO RECEIVE CORR.-RESISTANT INSERTS AND TIEBACKS. INSERT BOXES AND ANCHOR SUPPORTS VARY IN SIZE ACCORDING TO WEIGHTS OF MARBLE FACING
- WIRE TIEBACK CEMENTED INTO BOX
- 1/4" x 1/2" CORR.-RESISTANT ANCHOR SUPPORTS (SEE PLAN)
- CONCRETE BACKING
- METAL SHIMS FOR ADJUSTMENT
- BOX FILLED WITH CEMENT



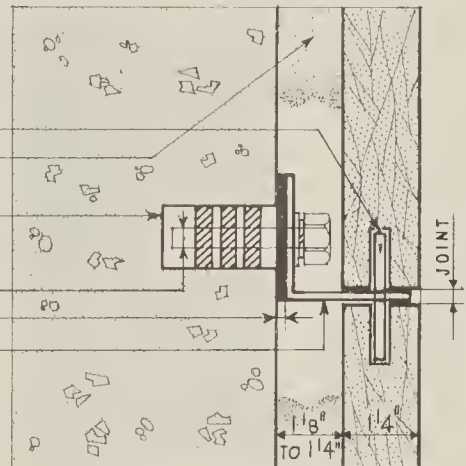
S E C T I O N

D E T A I L "D"

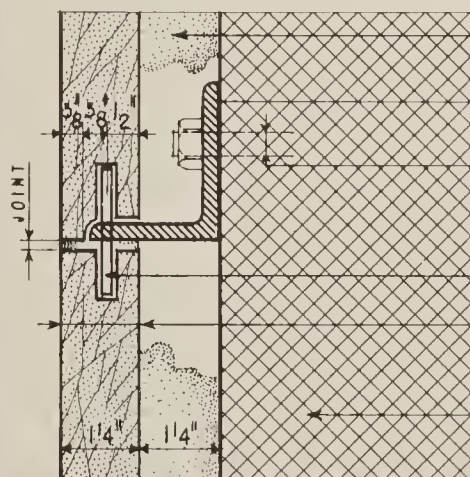


D E T A I L "B"

- 1/4" DOWELS IN ALTERNATING POSITIONS SET AT ANGLE TO OFFSET SHEARING MOMENT OF MARBLE LINERS. DOWELS SHALL BE INSTALLED AFTER LINERS ARE APPLIED
- CEMENT SPOTS OR SETTING PADS
- 1/8" CORR.-RESISTANT TIEBACK WEDGED AND CEMENTED INTO JOINT
- 3/16" PIN
- CONTINUOUS BRICK CORBEL SET LEVEL WITH TOP OF SLAB FOR BEST RESULTS. ADDITIONAL CORBEL COURSE DEPENDS ON WEIGHT OF MARBLE SUPPORTED
- 2" x 3/16" ALUMINUM DOWEL
- CEMENT SPOTS OR SETTING PADS
- WEDGE CINCH ANCHOR OR EQUAL
- BOLT SIZE REQUIRED TO SUPPORT LOAD
- SHIMS AS REQUIRED
- 2" x 2" x 1/4" ALUM. ANGLE

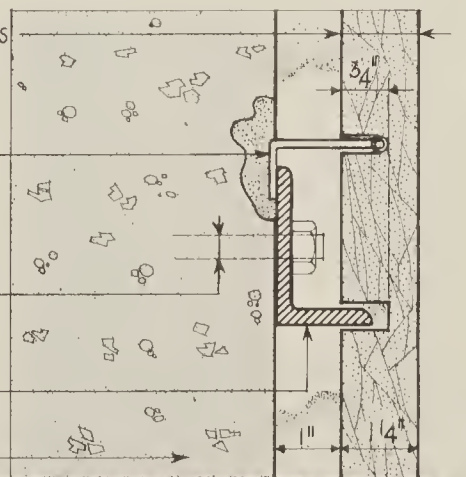


D E T A I L "E"



D E T A I L "C"

- CEMENT SPOTS OR SETTING PADS
- SHELF ANGLE
- EXPANSION OR OTHER TYPE BOLTS
- 3/16" PINS DROPPED THRU ANGLE
- MARBLE
- MASONRY BACKING
- FOR VENEER APPLICATIONS OF 1/4" AND THICKER STOCK ONLY
- 1/8" WIRE HOOKED OVER FLANGE OF ANGLE
- EXPANSION OR OTHER TYPE OF BOLTS
- SHELF CLIP ANGLE
- CONCRETE BACKING



D E T A I L "F"

relieving angle support where angle cannot be placed at bottom of slab

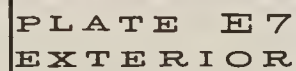
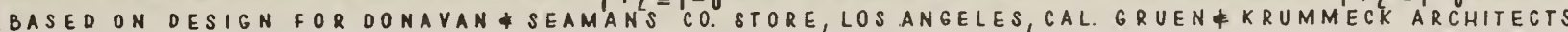
SCALE 3"=1'-0"

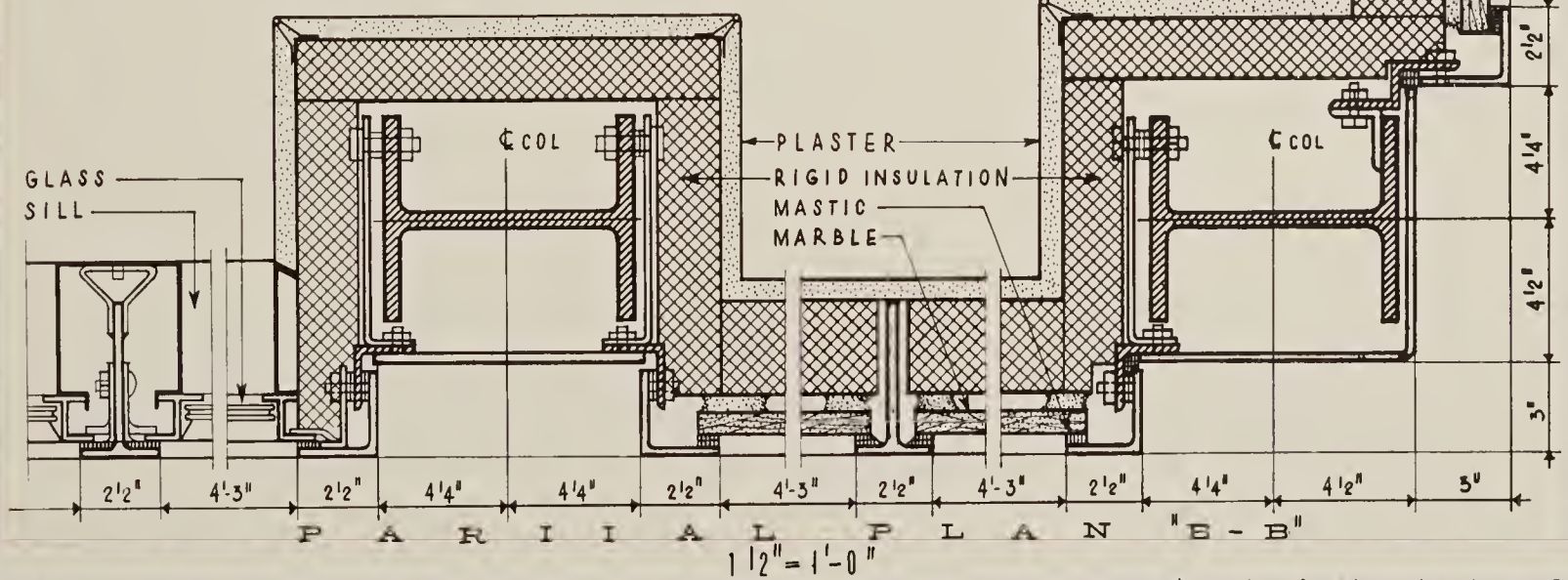
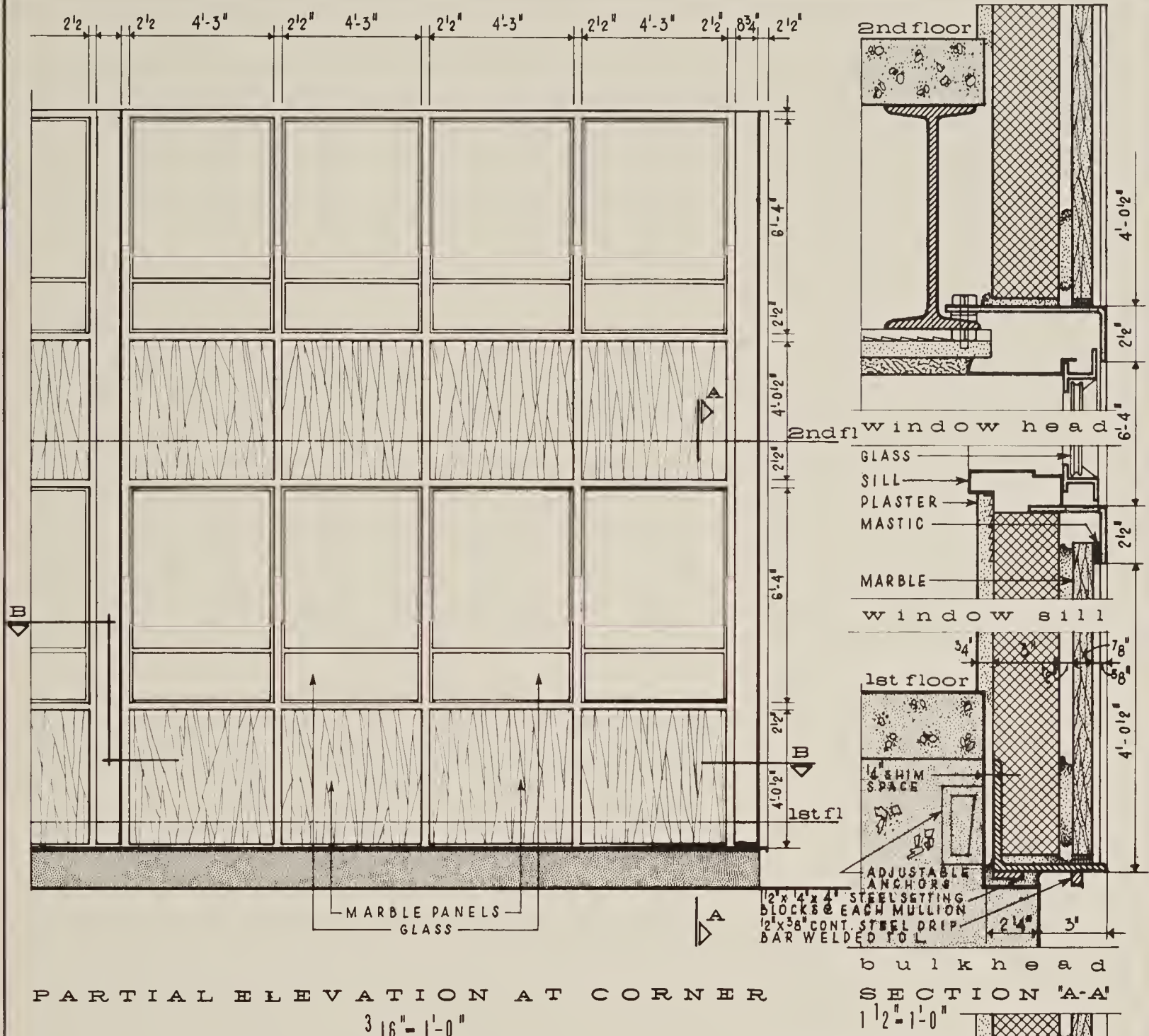


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SUPPORTING EXTERIOR
MARBLE WALL FACINGS

PLATE E6
EXTERIOR





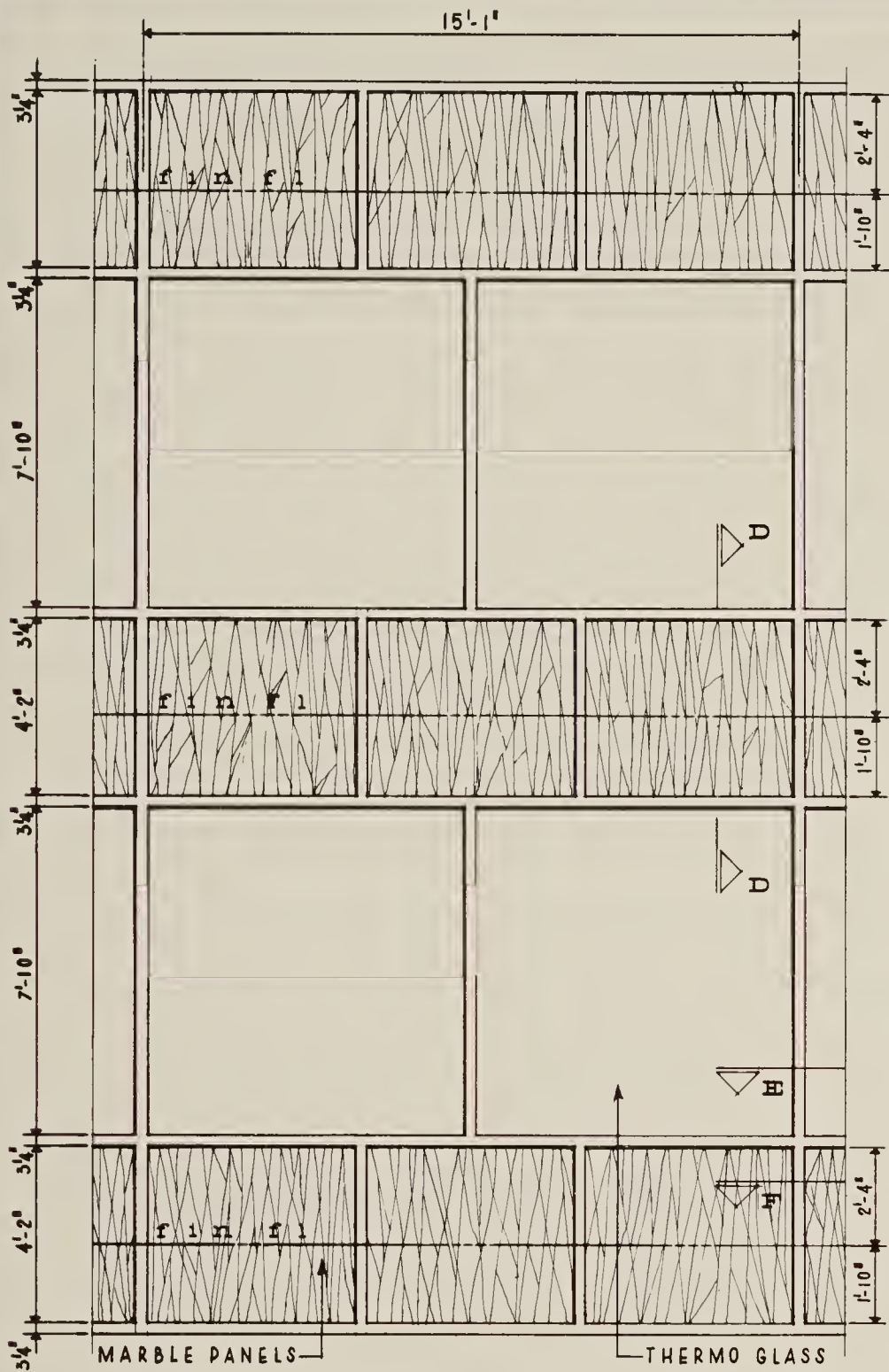
FROM THE OFFICE BUILDING FOR THE GULF OIL CORP, ATLANTA GA.-I.M. PEI ARCHITECT-STEVENSON & WILKINSON, ASSOCIATE ARCHITECTS



Marble Institute
of America, Inc.

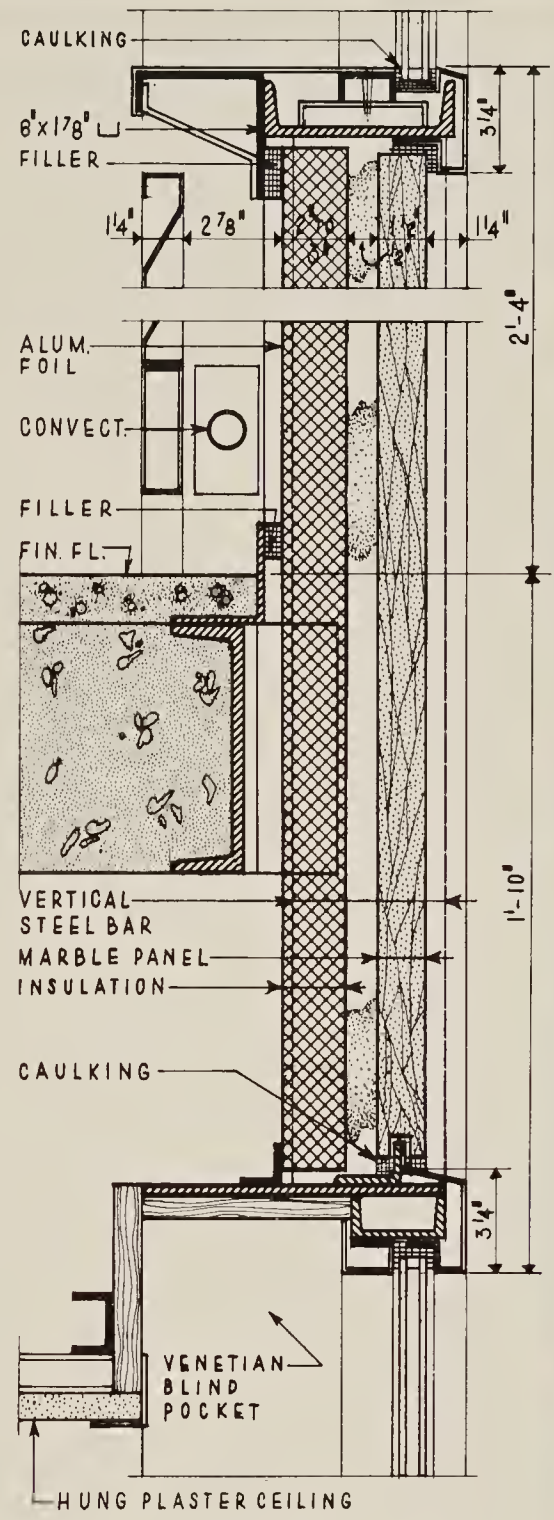
MARBLE TREATMENT
FOR CURTAIN WALL

PLATE E8
EXTERIOR



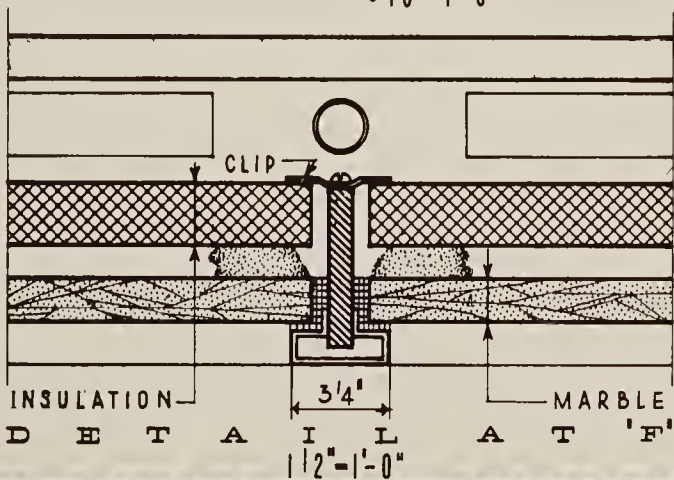
PARTIAL ELEVATION

3'6"=1'-0"



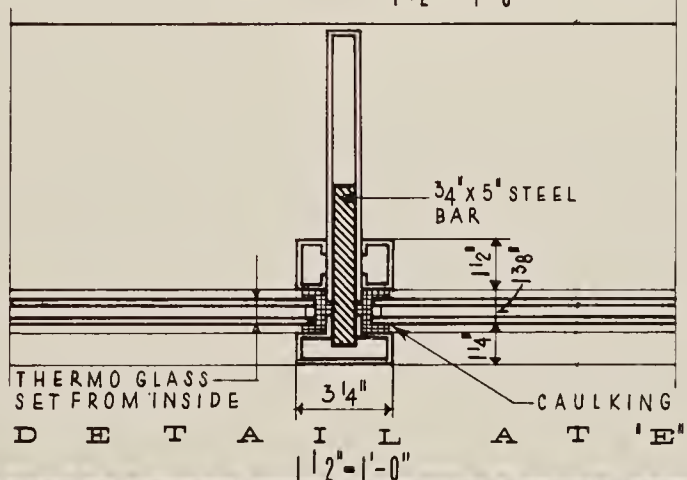
SECTION D-D

1'2"=1'-0"



DETAIL A-F

1'2"=1'-0"



DETAIL A-E

1'2"=1'-0"

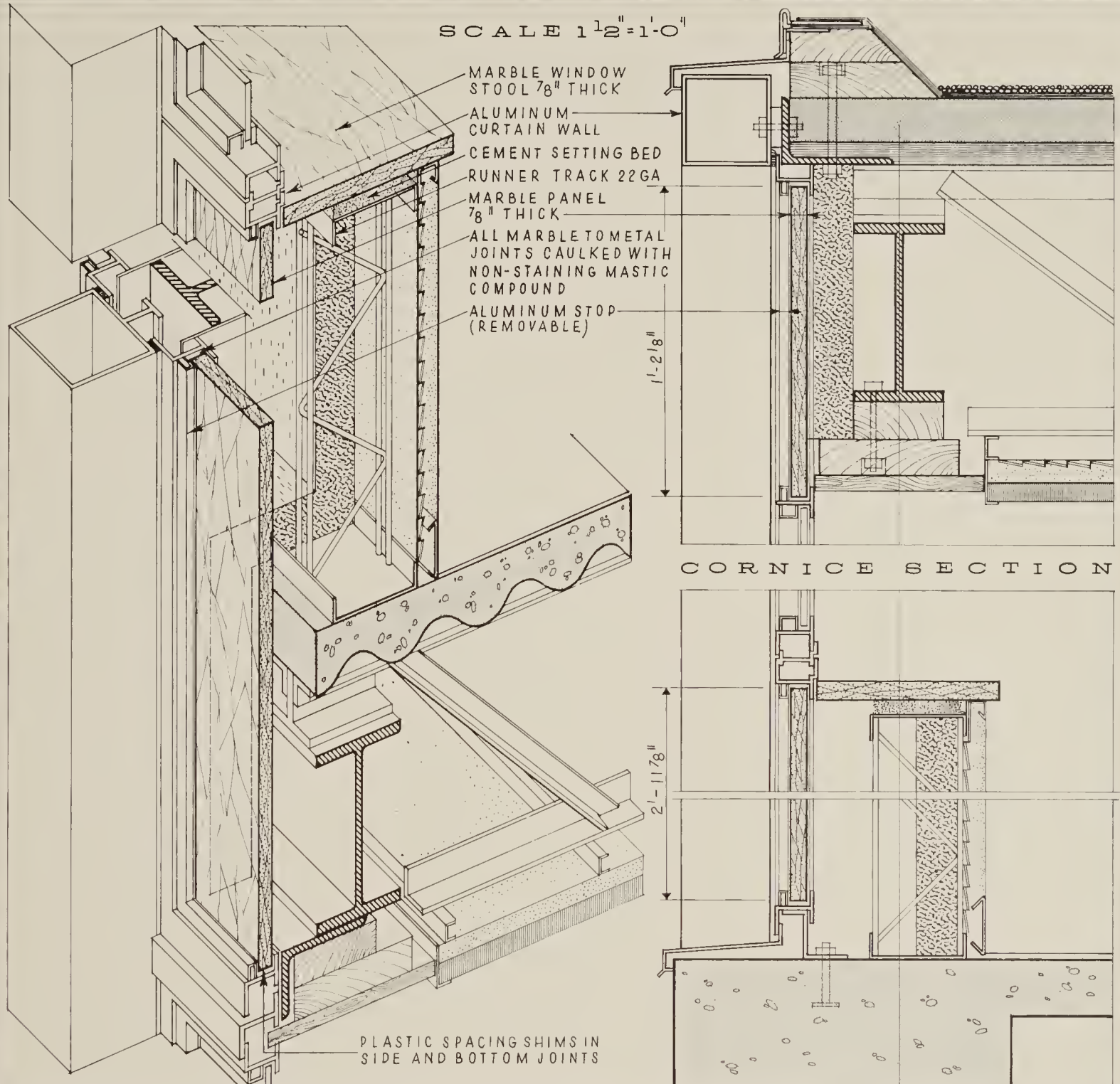
DESIGN TAKEN FROM THE DETROIT BRANCH, FEDERAL RESERVE BANK OF CHICAGO.-SMITH, HINCHMAN & GRYLLS ARCHITECTS



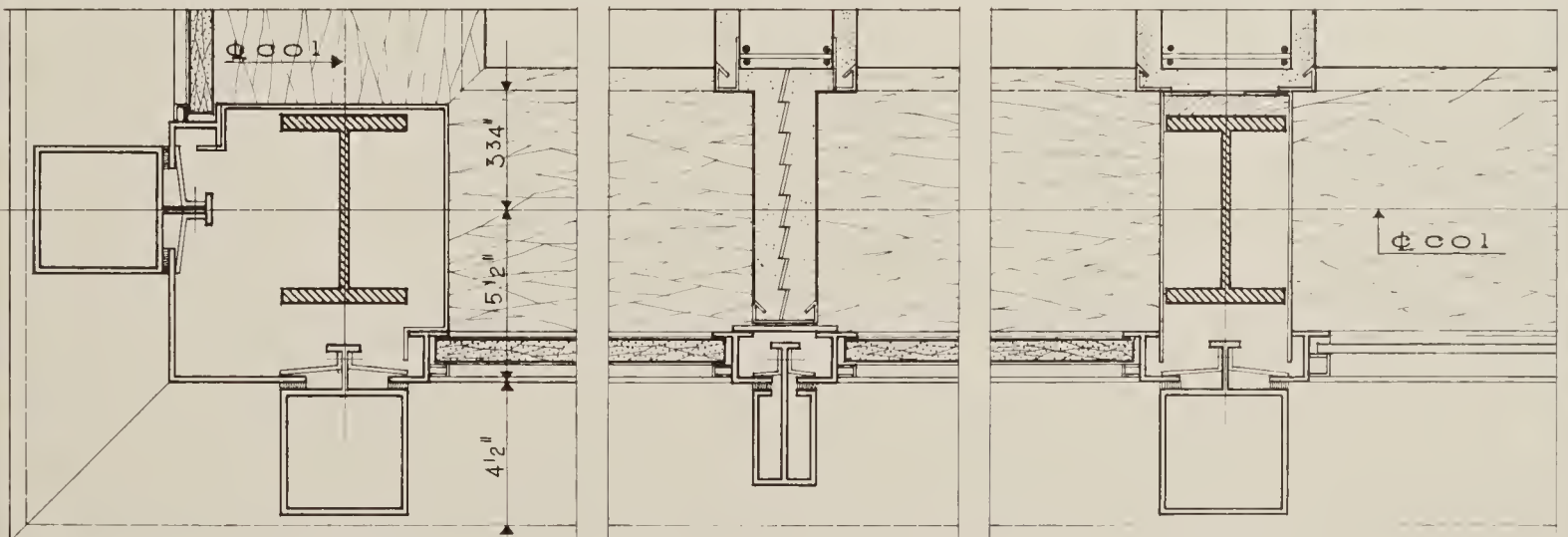
Marble Institute
of America, Inc.

MARBLE TREATMENT
FOR CURTAIN WALL

PLATE E9
EXTERIOR



ISOMETRIC VIEW OF 2ND FL SPANDREL FIRST FLOOR SILL AND WINDOW SILL SECTION



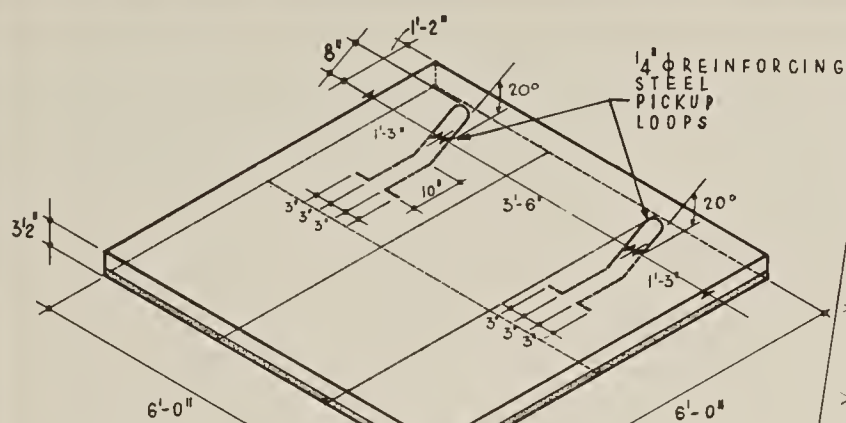
detail at corner intermediate detail at column
 TYPICAL MULLION DETAILS
 DETAIL FROM WBIR-TV BUILDING, KNOXVILLE TENNESSEE - PAINTER, WEEKS & McCARTY ARCH.



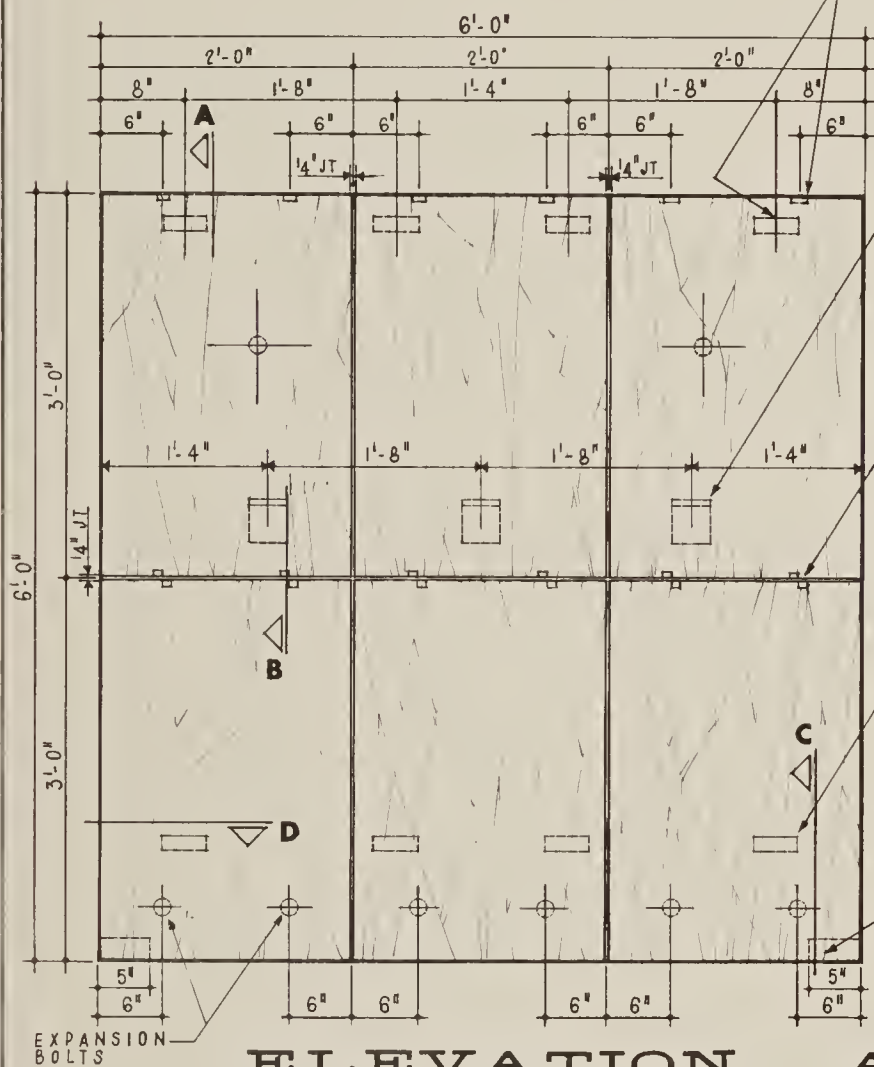
Marble Institute
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MARBLE TREATMENT
 FOR CURTAIN WALL

PLATE E12
 EXTERIOR

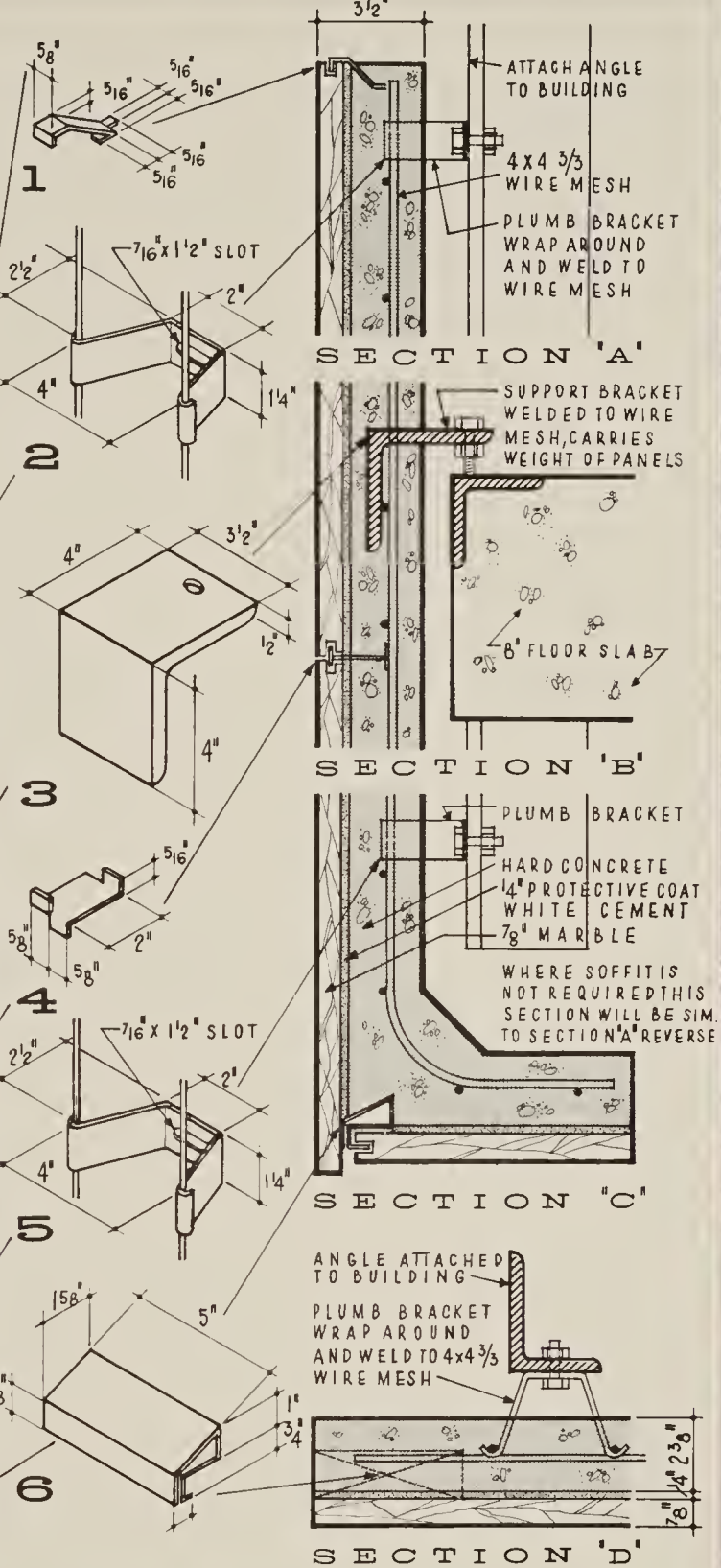


ISOMETRIC



ELEVATION

$\frac{1}{2}'' = 1'-0''$



ANCHORS DETAILS

$\frac{1}{2}'' = 1'-0''$

1 MIX FOR HARD CONCRETE

- 215 LBS CEMENT
- 445 LBS SAND
- 840 LBS RIVER GRAVEL
- 1,500 LBS YIELD 10 CUBIC FEET
- ADD WATER FOR A DRY MIX. SET 12 HOURS

2 MIX FOR $\frac{1}{4}''$ PROTECTIVE COAT

- 1 PART WHITE WATERPROOF CEMENT
- 2 PARTS MEDIUM SAND
- ADD SIKAC-BONDING AGENT
- LET SET ABOUT 1 HOUR, THEN POUR #1 MIX AND AGITATE WITH HAND TAMPER

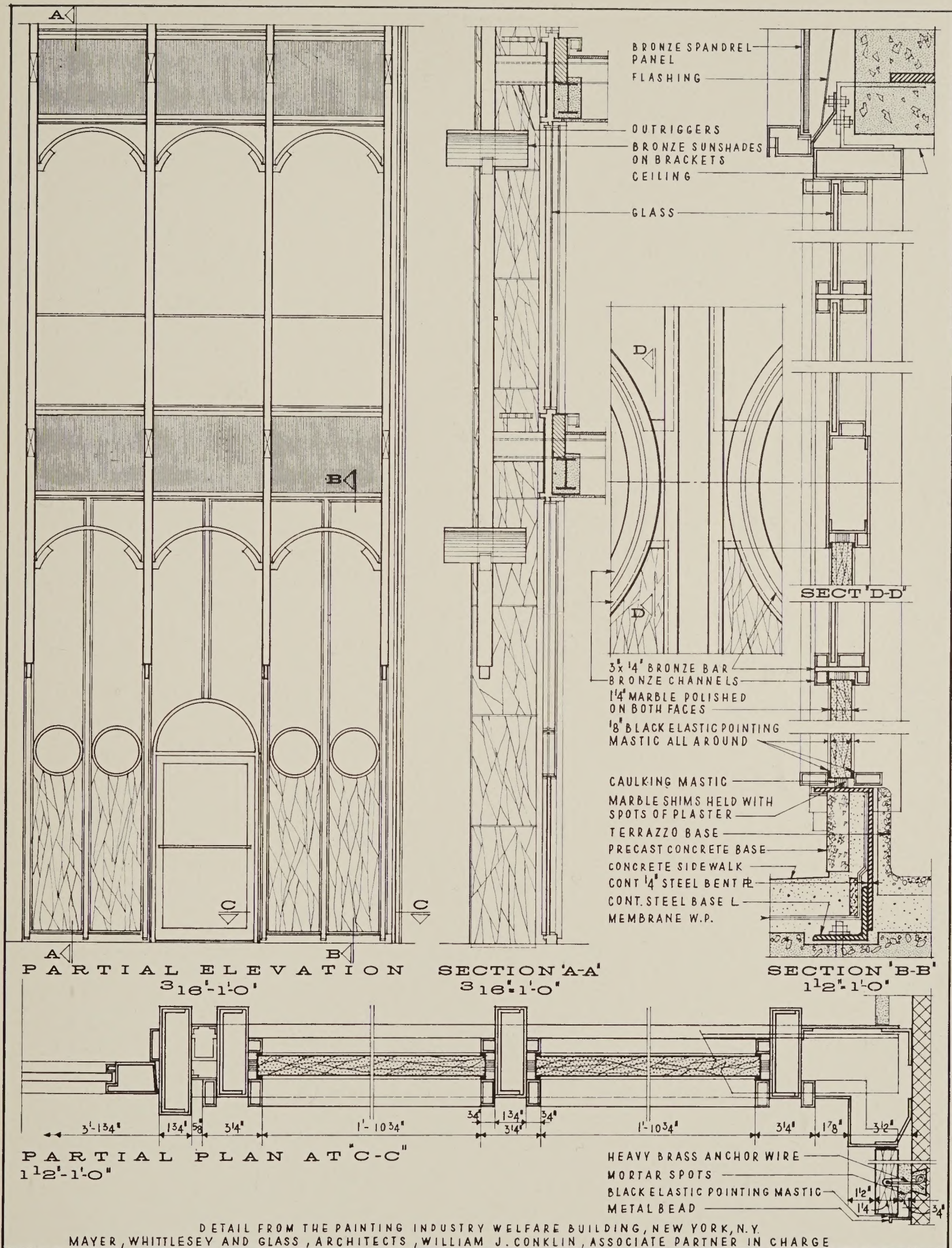
BASED ON DESIGN FOR PANELS USED ON THE WASHINGTON BUILDING, SEATTLE, WASHINGTON-ARCH. NARAMORE, BAIN, BRADY & JOHANSON



**Marble Institute
of America, Inc.**

**MARBLE FACED PRECAST
REINFORCED CONCRETE
BUILDING PANELS**

**PLATE E13
EXTERIOR**



**Marble Institute
of America, Inc.**

**MARBLE TREATMENT FOR
A BUILDING FACADE**

**PLATE E14
EXTERIOR**

